

FM 11-125

DEPARTMENT OF THE ARMY FIELD MANUAL

FIELD ARMY

SIGNAL COMMUNICATIONS

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FIELD ARMY SIGNAL COMMUNICATIONS

FM 11-125, 10 December 1969, is changed as follows:

1. Remove and insert pages as indicated below:

Remove pages	Insert pages
✓ 1-1	1-1 ✓
✓ 2-1 through 2-4	2-1 through 2-4 ✓
✓ 3-1 through 3-10	3-1 through 3-10.1 ✓
✓ 3-17 through 3-20	3-17 through 3-20 ✓
✓ 3-23 through 3-27	3-23 through 3-27 ✓
✓ 4-1 through 4-4	4-1 through 4-4 ✓
✓ 5-1 and 5-2	5-1 and 5-2 ✓
✓ 6-1 through 6-4	6-1 through 6-14 ✓
✓ 9-7 and 9-8	9-7 and 9-8 ✓
✓ 11-5 and 11-6	11-5 and 11-6 ✓
✓ 22-9 through 22-12	22-9 through 22-13 ✓

2. A star indicates new or changed material.
3. File this page in front of manual for reference purposes.

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FIELD MANUAL

No. 11-125

HEADQUARTERS
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*This manual supersedes FM 11-75, 23 February 1968; FM 11-86, 30 December 1958; FM 11-95, 2 May 1968; FM 11-127, 10 March 1966; and FM 11-147, 15 March 1966, including all changes.

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PART ONE

SIGNAL COMMUNICATIONS

CHAPTER 1

INTRODUCTION

★1-1. Purpose and Scope

a. This manual provides doctrinal guidance for establishing a field army communications system. The manual has two parts.

(1) Part One contains broad field army communications doctrine. This part also has board army doctrinal guidance related to the organization and employment of field army signal units responsible for planning, establishing, maintaining, controlling, and using the communications systems in the field army. Part One is intended primarily for use by commanders, staff officers, and other key personnel.

(2) Part Two has more detailed information about organizational and technical operations of the field army signal brigade and its units in the installation, operation, and maintenance of the field army communications system. Signal units that install, operate, and maintain internal communications for the Field Army Support Command (FASCOM) are included in this part.

b. This manual is in consonance with the International Standardization Agreements, STANAG 2043, Principles and Procedures for Establishing Communications, and STANAG 2079, Rear Area Security and Rear Area Damage Control. These agreements are identified at the beginning of appropriate chapters in the manual.

★1-2. References

References listed in appendix A provide information related to material presented in this manual. For a complete understanding of field army communications and signal unit operations, and other activities that support such operations, readers should study the listed references (especially FM 11-50, FM 11-92, and FM 24-1) as well as this manual.

★1-3. Definitions

In this manual, terms and abbreviations are used as defined in AR 310-25, AR 310-50, and JCS Pub 1. Terms and abbreviations used in exception to this principle are defined where they first appear in the text.

★1-4. User Comments

Users of this publication are encouraged to submit recommended changes and comments to improve the publication. Comments should be keyed to the specific page, paragraph, and line of the text in which the change is recommended. Reasons will be provided for each comment to insure understanding and complete evaluation. Comments should be prepared using DA Form 2028 (Recommended Changes to Publications) and forwarded direct to the Commanding Officer, US Army Combat Developments Command Communications-Electronics Agency, Fort Monmouth, New Jersey 07703.

CHAPTER 2

FIELD ARMY

★2-1. Introduction

This chapter is a general introduction to the field army. It serves as a basis for subsequent presentation of the field army communications system and the signal units that provide this system. More detailed information about the field army and its operations appears in FM 100-5, FM 100-15, and FM 101-5.

★2-2. Field Army Functions

The field army is the largest US Army organization that has combat, combat support, and combat service support functions. It is a flexible combat maneuver element, capable of independent operations in a variety of environments. The field army may operate directly under a US Army group, the unified command (theater headquarters), a subordinate unified command, or the US theater Army (when the theater Army commander has retained operational control of the field army and has responsibility for direction of US combat force operations). In these circumstances the Army commander is responsible to the theater Army commander for combat service support in the field army. A field army may contain allied units, and it may operate under the direction of a combined force headquarters. In a combined theater, the field army commander may be responsible to a US Army group commander for combat, combat support and combat service support operations in the field army, or he may be under the operational command of a senior combined command headquarters and receive combat service support from a US theater Army.

★2-3. Field Army Organization

The field army has no fixed organization. It is composed of a headquarters, certain assigned army troops, a variable number of corps, and a variable number of divisions normally part of the corps. TOE 51-1 authorizes the organization of the field army headquarters and headquarters company. Higher headquarters assigns or attaches units to the field army. The field

army may either further assign or further attach units to the corps. Types and numbers of troops assigned and attached depend upon the mission, characteristics of the area of operations, availability of units, and the contemplated operations. The overall combat power of a field army is not restricted to that provided by the attached or assigned Army units. Supporting forces of the Army and other services, such as the Air Force, normally strengthen this power. For the purpose of this manual, a typical field army consists of three corps of four divisions each (fig. 2-1 and 2-2).

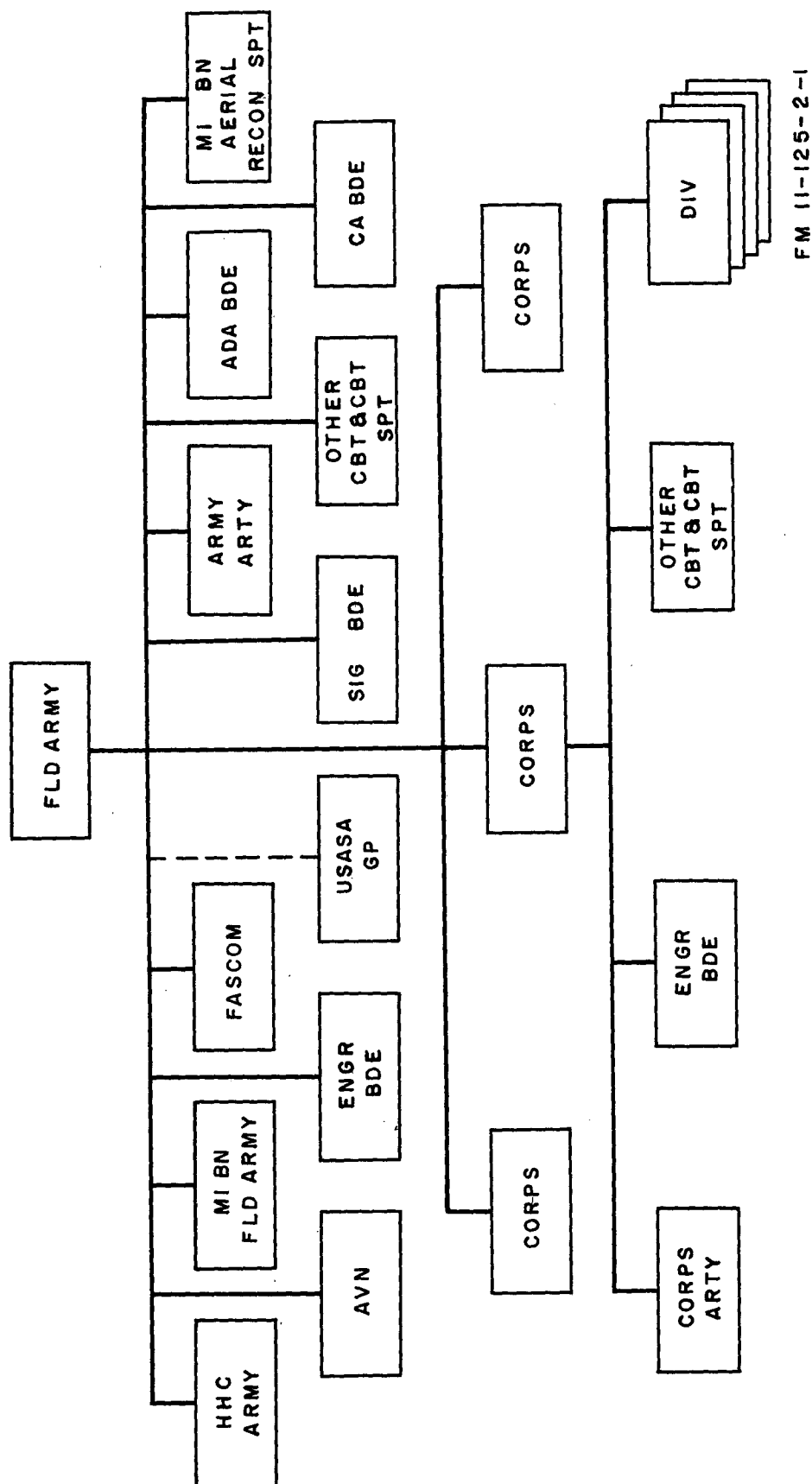
★2-4. Field Army Missions

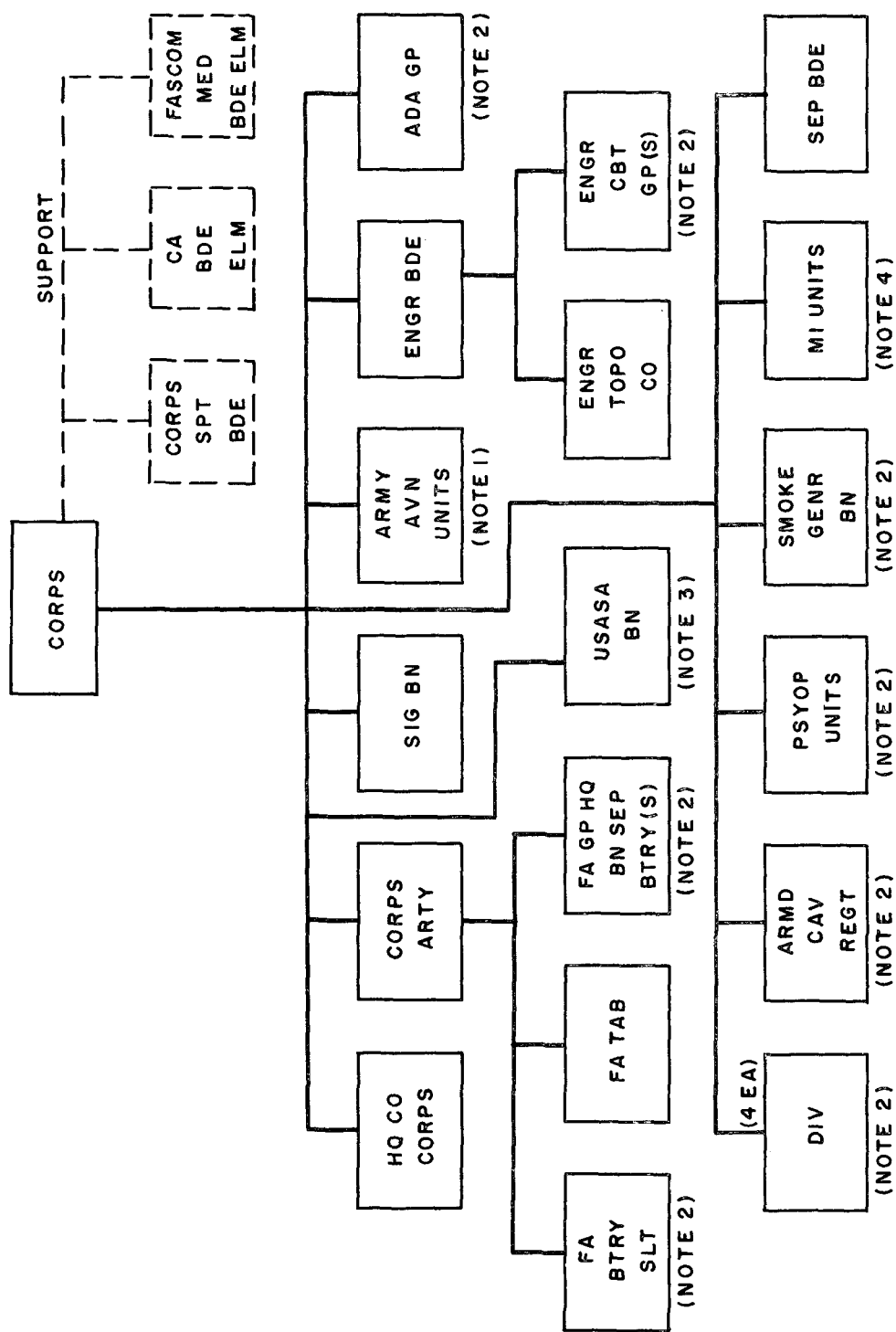
Higher commanders normally assign the field army its mission in a letter of instructions. The field army mission usually is broad and permits the field army commander great latitude in its accomplishment. From this mission the field army commander must determine the implied tasks that he must accomplish to fulfill his overall mission, in addition to any tasks that may have been delineated in the letter of instructions.

★2-5. Field Army Tactical Operations Center

a. The field army tactical operations center (FATOC) is located at the main command post, and a skeletonized FATOC is located at the alternate command post. The FATOC is a facility within which is grouped representation from the coordinating and special staff sections concerned within which is grouped representation from the coordinating and special staff sections concerned with current combat and combat service support operations. The FATOC provides a central facility in which those staff members who control and coordinate current operations can work in close coordination with one another. The FATOC exists for the purpose of performing the following broad functions:

(1) Provide current information on the operational situation.



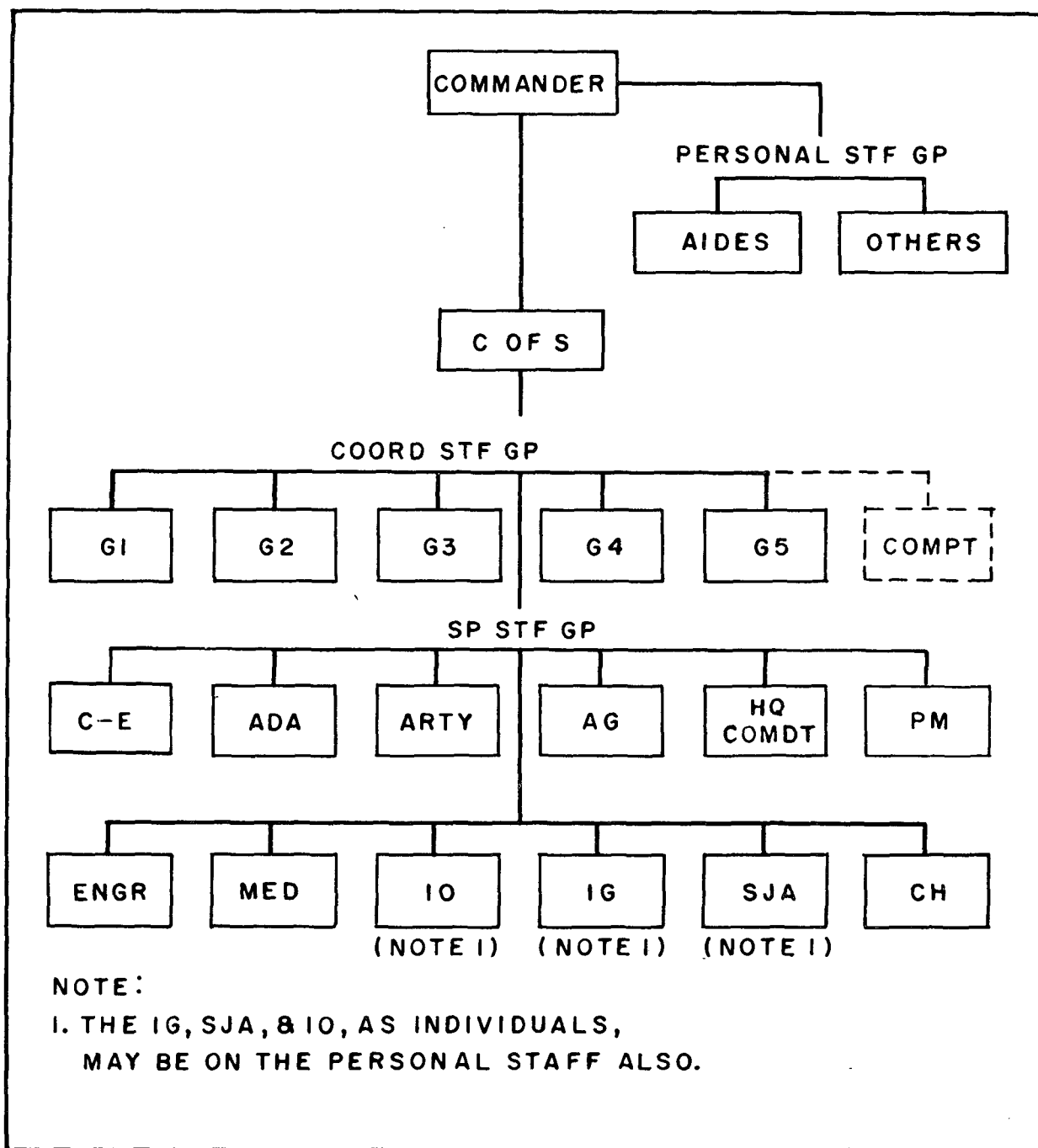


FM 11-125-2-2

Figure 2-2. Type corps organization (part of a large landmass field army).

(2) Provide the commander with facts and recommendations on which he may base a decision.

(3) Within established policies and com-

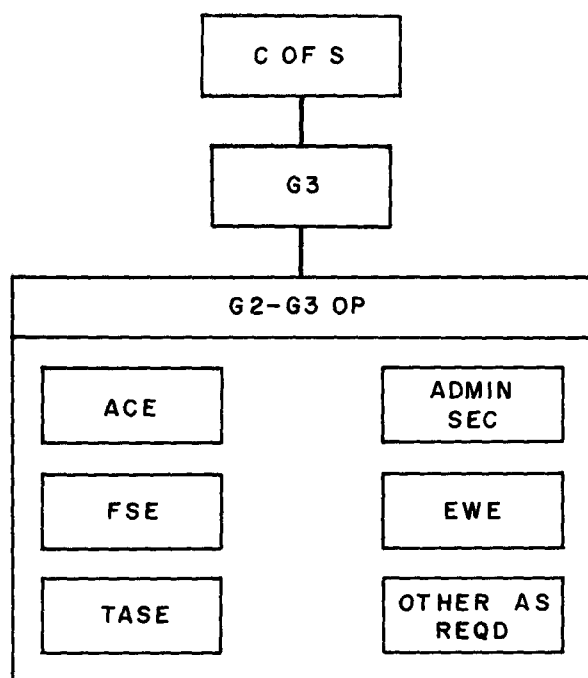


FM 11-125-2-3.1

Figure 2-3. Type field army staff organization.

mand guidance, take immediate action on operational matters to include the issuance of necessary implementing and coordinating instructions without reference to the commander.

b. The operations elements of the G2 and G3 sections constitute the nucleus of the FATOC. The operations elements, or portions thereof, of the other coordinating and special staff sections are included in the FATOC as considered necessary by the commander to insure expedited staff reactions, command decisions, and implementation of the decisions. The internal organization of the elements may vary with operational requirements and the desires of the commander. A typical FATOC (fig. 2-4), under the overall direction of the chief of staff and the general staff responsibility of the G3, normally consists of the following elements on a recurring and continuous basis:



FM 11-125-2-4

Figure 2-4. Type field army tactical operations center.

- (1) G2-G3 operations, composed of a G2 and a G3 element.
- (2) Air Space Control element (ACE).
- (3) Administration section.
- (4) Tactical Air Support element (TASE).
- (5) Fire Support element (FSE).
- (6) Electronic Warfare element (EWE).

c. Personnel needed for special or nonrecurring situations depend upon the requirements of the operations and the support situation. On-call representatives may be required but are not limited to the following TOC elements:

- (1) Engineer element (ENGRE).
- (2) Chemical, Biological, and Radiological element (CBRE).
- (3) Communications-Electronics element (CEE).
- (4) G1, G4, and G5 representation.
- (5) Special Ammunition Logistics element (SALE).

d. The communications-electronics element (CEE), when required by the commander, is provided by the signal section of field army headquarters. It consists of an assistant army COM-MEL staff officer, a communications operations officer, two electronic warfare (EW) officers, two operations sergeants, and two clerk typists. The CEE is the ACSC-E's, COMMEL staff officer's representation in the FATOC, and it supervises and coordinates the communications-electronics system for command and control of tactical operations within the field army. A detailed description of the specific functions of each FATOC element may be found in appendix L, FM 101-5.

e. Major activities taking place within the FATOC include:

- (1) Continuous and simultaneous evaluation of available information by affected FATOC elements and issuance of timely instructions.
- (2) Communication of tactical information and requirements to appropriate coordinating staff sections (particularly G1, G4, and G5) and instructions to tactical units and support units or agencies.
- (3) Continuous transmission of situation information by each element in the FATOC to its corresponding element in the alternate FATOC.
- (4) Continuous display and evaluation of intelligence required for current combat support operations.
- (5) Continuous display of data, including essential combat service support data, on the status and operations of the command and friendly forces to permit immediate decisions on combat and combat support operations.

f. The alternate FATOC should be prepared to take over immediately in the event that the FATOC at the main command post becomes

ineffective for any reason. The chiefs of the general and special staff sections concerned should insure that their elements in the alternate FATOC have available the necessary information in order to take over from the FATOC. Standing operating procedures should provide for rapid movement of effective survivors to the alternate

FATOC in order to build up staff representation. Since continuity of operations is a prerequisite, the FATOC and alternate FATOC should not move at the same time. The alternate FATOC reinforced by the off-duty team from the TOC, takes over until the main FATOC is again ready to resume control.

CHAPTER 3

★FIELD ARMY COMMUNICATIONS SYSTEM (STANAG 2043)

Section I. INTRODUCTION

3-1. General

a. Success in battle will always depend upon the ability of the field commander to effectively command and control his forces, acquire timely intelligence information, and to deliver accurate fire power. Because of its emphasis on dispersion, mobility, and flexibility, this concept of operations requires a signal communications system that is also dispersed, mobile, and flexible. The field army communications system must be able to absorb damage from nuclear attack without complete disruption of service. It must be flexible and capable of quick reaction in order to meet the rapid changes encountered in operational and tactical plans.

b. The extent of the territory over which a field army may be deployed depends upon its mission and the tactical situation. The field army may be deployed over a front of 320 km (200 miles) and to a depth of approximately the same distance. In the event of a major penetration of the enemy position, depths of up to 480 km (300 miles) may be encountered.

3-2. Basic Requirements

To meet requirements and to provide signal communications based on the needs of the modern battlefield, the field army communications system must:

- a.* Provide communications support to widely dispersed units and installations.
- b.* Have facilities to make possible the electrical routing and rerouting and the physical location and relocation of circuits with a minimum amount of change to the basic system.
- c.* Be composed of building-block type signal units so that rapidly changing requirements can be met by adding or removing troop elements.

d. Provide a common-user communication system for those units that would otherwise require extensive organic facilities.

e. Provide sole-user (dedicated) circuits for those units that can justify the need for them.

f. Be sufficiently flexible to provide continuity of communications in the event of destruction or capture (or other loss of personnel and equipment) to portions of the signal system.

g. Be mobile enough to keep pace with rapidly moving tactical units.

h. Have a high channel capacity, capable of meeting the demands for command and control, fire control, intelligence, or administrative-type traffic that will be placed upon it.

i. Operate over extended distances.

3-3. Characteristics of the Field Army Communications System

The field army communications system varies in configuration, size, and composition according to the following:

- a.* Mission, composition, and organization of the field army.
- b.* Location and disposition of supported forces, units, and installations.
- c.* Terrain and size of the field army area.
- d.* Enemy capabilities.
- e.* Availability of reliable indigenous facilities.
- f.* Number of signal centers comprising the system.
- g.* Communications-electronics requirements of the supported forces, units, and installations.

3-4. Common-User System

The field army communications system is basically designed as a common-user system. Sole-user or dedicated circuits, when properly justified by the user and approved by the field army commander, are provided where delays encountered over common-user circuits cannot be tolerated.

★3-5. Signal Centers

a. A signal center is a grouping of signal communications facilities installed, operated and maintained by army signal troops. The two types of signal centers are command signal centers and area signal centers. Each signal center normally provides a communications center and messenger service, telephone switching and teletypewriter service, a circuit and rerouting facility, radio wire integration (RWI) stations, single channel and multichannel radio, wire communications, facsimile and cryptographic service. Communications for automatic data processing

will be provided when such ADP equipment is fielded.

(1) *Command signal centers.* Command signal centers (COMSIGCEN) provide signal facilities for specific command headquarters and to designated units located in the immediate vicinity.

(2) *Area signal centers.* Area signal centers (ASIGCEN) provide signal support within designated geographical areas, and serve all units within the area requiring such support. Area signal centers remain under the operational control of the signal officer of the unit providing the center. Internal signal communications remain the responsibility of the supported units.

b. A unit or headquarters command signal center may be connected to another command signal center, to an area signal center, or to both. For example, the command post (CP) at corps main is connected by multichannel radio links with army main (a command signal center) *and with at least two area signal centers.*

Section II. FIELD ARMY COMMUNICATIONS

★3-6. Command Responsibility for Communications

a. To properly control his forces, the commander must be provided with an efficient and effective communications system as well as trained personnel. Commanders at all echelons are responsible for the signal communications facilities installed, operated, and maintained for their command.

b. Specifically, the field army commander is responsible for the field army command and area communications systems. The corps and division commanders have similar responsibilities with respect to the corps and division communications systems. A detailed discussion of the corps and division communications may be found in FM 11-92 and FM 11-50.

★3-7. Signal Communications Systems of Field Army

(fig. 3-1 and 3-2)

Multichannel communications systems in support of Army headquarters are engineered, installed, operated and maintained by signal units assigned or attached to the Army signal brigade. These systems are field army command

system and field army area system. This manual will deal primarily with the army command and area systems, and will include the units that provide the internal communications support for the field army support command requirements.

★3-8. Air Defense Artillery Multichannel Communications System

The air defense artillery multichannel communications system is designed and established to fulfill the tactical communications requirements for ADA units operating with electronic Air Defense Command, Control and Coordination Systems (ADCCCS). At Group Brigade level the system is installed, operated, and maintained by signal units assigned to air defense brigade and group headquarters. At battalion level, the system is installed, operated and maintained by organic personnel. This system provides direct communications (digital data and voice) between various air defense echelons (ADA brigade, group, battalion, and fire unit). Multichannel communications links and channel requirements are outlined in FM 44-1. In addition to the above system, the Army commander may allocate trunks from the Army area communications system for air defense artillery sole use. These trunks normally connect the facilities at

brigade and group headquarters with subordinate units and may be used for alternate routing and standby or special purposes. The Army commander may also make available common-user trunks of the Army area communications system for the use of ADA headquarters and units. The ADA multichannel communications system will be connected to the Air Force tactical air control system or the Marine Corps tactical data system. Interconnection of the ADA multichannel communications system and the Army area communications system is accomplished by personnel and terminal equipment provided by the signal troops which operate the Army area communications system.

★3-9. Corps Communications System

The corps communications system is primarily a command system which is installed, operated, maintained, and controlled by the corps signal battalion. This system provides direct communication between the echelons of corps headquarters, from these echelons to the echelons of subordinate divisions; and to corps troops. In addition, the army commander may allocate trunks from the army area communications system for the sole use of corps. These trunks normally connect the facilities at corps headquarters with units subordinate to corps and may be used for alternate routing and standby or special purposes. The army commander may also make available common-user trunks of the army area communications system for the use of corps headquarters and corps units. Interconnection of the corps command system and the Army area communications system is accomplished by personnel and terminal equipment provided by the field army signal brigade. When integrated, the two systems provide the corps with the degree of signal communications flexibility necessary to survive on the nuclear battlefield. Refer to FM 11-92 for a complete description of the corps communications system.

★3-10. Division Communications System

a. The division communications system is an integrated command and area communications system which can be best termed a division multichannel system. The division system provide the *communication* means necessary for the *coordination* of division tactical operations, insures command-control communications, and provides a high degree of assurance that communications for administrative and logistic support are available.

b. The division communications system has both command communications system and area communications system characteristics. The multichannel portion of the division communications systems as described in FM 11-50 consists of the command as well as secondary or area links. The multichannel communications systems consist of multichannel radio, carrier, and cable facilities installed and operated by the signal battalion.

(1) The command or priority multichannel links interconnect division main and alternate to each brigade, division main to division artillery headquarters, division main and alternate to division support command, division main to division alternate, division main to the airfield, division main to the Air Defense Artillery (ADA) battalion, and division alternate to division artillery when not adjacently located.

(2) The secondary multichannel or area links complement the command links and offer a wider area and alternate routing paths within the multichannel network. These links provide the basic communications from the division support command to support elements in the brigade areas of the division and interconnect area signal centers of division main, alternate and support command CP's; area signal center to brigade; lateral links between area signal centers; and lateral link to the adjacent division.

Section III. FIELD ARMY COMMAND COMMUNICATIONS

3-11. General

a. The communications system for command and control of combat, combat support, and combat service support elements in the field army consists of a multichannel, multimeans, multi-axis, integrated network extending from the field

army rear boundary to the rear boundaries of the combat divisions (para 3-7).

b. The principal function of the army command communications system is to provide rapid, secure, and reliable communications to meet the operational requirements of the field army com-

mander. The command communications system is installed, operated, and maintained jointly by the army command signal operations battalion and the army command signal radio and cable battalion of the army signal brigade.

Figure 3-1. Type field army command communications system.

(Located in back of manual.)

★3-12. Command Communications System of the Field Army

The field army command communications system (fig. 3-1) connects the echelons of field army headquarters with each other, with major subordinate commands, and with adjacent field armies. The system basically provides multi-channel links between command signal centers. Long-range, high-frequency radio links normally carry a portion of the traffic and, in addition, provide a backup capability in the event that the multichannel radio links are disrupted. The system also includes air and motor messenger service. RWI facilities are provided by the command radio and cable battalion at army main and alternate CP's.

3-13. Employment Concept of Army Signal Brigade

The signal brigade commander utilizes elements of the army command signal operations battalion to provide the internal communications required at the main, alternate, and rear echelon of army headquarters. He employs elements of the army command signal radio and cable battalion to provide the interconnecting links between these echelons; to provide the connecting links between these echelons and the echelons of major subordinate units; and to provide the subordinate units with personnel and equipment to terminate these links and to connect them with facilities organic to the subordinate units.

★*a. Army Main.* The command signal center established at army main is installed, operated and maintained by the following units:

(1) Headquarters and headquarters company, army command signal operations battalion, TOE 11-96.

(2) A telephone operations company, TOE 11-97.

(3) A communications center company, TOE 11-98.

(4) A command radio company, TOE 11-77.

(5) A wire platoon, command wire and cable company, TOE 11-78.

★*b. Army Alternate.* The command signal center established at the army alternate is installed, operated, and maintained by the following units:

(1) Headquarters and headquarters company, army command signal radio and cable battalion, TOE 11-76.

(2) A command radio company, TOE 11-77.

(3) A wire platoon, cable and wire company, TOE 11-78.

(4) A telephone operations company, TOE 11-97.

(5) A communication center company, TOE 11-98.

3-14. Internal Signal Center Facilities, Army Main and Alternate

a. The command signal centers at army main and army alternate are each staffed and equipped to provide a systems control center (SYSCON-CEN). The systems control centers for army main and army alternate are provided by the headquarters and headquarters companies of the army command signal operations battalion and the army command signal radio and cable battalion. Each headquarters and headquarters company provides one communications operations shelter at each location from which systems control operations are conducted. For a discussion of systems control, refer to paragraphs 3-37 and 3-38.

b. Technical control centers (TECHCON-CEN) are also provided at the main and alternate echelons of army headquarters (fig. 3-3). Shelter-mounted communications patching panels are provided for this purpose. For a discussion of technical control centers, refer to paragraphs 3-37 and 3-38.

c. The telephone operations company at army main and the company at army alternate provide each of these echelons with two van-mounted manual telephone central offices. Each switchboard is capable of interconnecting trunk and local switching facilities for 600 local or common battery subscriber lines and 60 manual or dial trunks. One switchboard at each location is installed for use; the other is intended for displacement, augmentation, or for special purposes.

d. The communications center company at main and the company at alternate provide teletypewriter service at each of these echelons with two van-mounted teletypewriter relay stations and four van-mounted teletypewriter terminals. Each teletypewriter relay station is capable of furnishing eight full-duplex (FDX) teletypewriter trunks for use in either the tape relay or manual teletypewriter systems; each teletypewriter terminal is capable of providing four full-duplex trunks. In addition, one company provides army main with four truck-mounted operations shelters from which message center off-line cryptographic, facsimile, and messenger operations are conducted. The second communications center company provides identical functions at the alternate command post.

e. Field army tactical operations centers are established at the main and alternate command posts of field army headquarters. These tactical operations centers, fully described in FM 101-5, are provided with internal communications by the telephone operations company and the communications center company located at each command signal center for the main and alternate echelons of the field army. A type FATOC communications equipment configuration is illustrated in figure 3-4.

(1) The telephone operations companies provide each FATOC with a truck-mounted, shelter-installed central telephone office. In addition, each telephone company also furnishes a shelter-mounted communications patching panel and a central power source. Each FATOC switchboard is connected by cable to the patching panel in the FATOC area which, in turn, is connected to the patching panel at the technical control center in the command post area.

(2) The communications center company at army main provides the FATOC with three teletypewriter operations centers, three teletypewriter terminals, a message center, and a facsimile facility located in the operations shelters. Similar facilities are provided by the communications center company located at the alternate CP. These facilities, either van or truck-mounted, are also connected by cable to the communications patching panel in the FATOC area and, in turn, to the patching panel of the technical control center located in the alternate and main command post areas.

★3-15. Internal Signal Center Facilities for Army Rear

a. The army rear signal operations platoon, headquarters and headquarters company, army command signal operations battalion, provides the internal communications required of army rear headquarters. The platoon is provided with shelter-installed, truck-mounted assemblages (fig. 3-5) as follows:

(1) A 3-position, 200-line, 20 trunk, manual telephone central office (AN/MTC-1).

(2) A communications patching panel to function as a technical control center.

(3) A message center operations shelter.

(4) A teletypewriter terminal.

(5) A radio wire integration station.

b. The multichannel terminals link with both army main and army alternate and are provided by one of the two radio command companies of the army command signal radio and cable battalion. This dual terminal must be capable of terminating a link from army main and a link from army alternate. Army rear is also connected with multichannel facilities to at least one army area signal center. Both terminals of this link are supplied by the army area signal center (fig. 3-2).

c. The command radio company providing army rear with the multichannel terminal equipment (b above) will also provide a high frequency radioteletypewriter set. This RATT set will be used as a station in command net No. 6, as described in paragraph 3-19.

3-16. Multichannel Communications Between Command Signal Centers

★a. Command signal centers comprising the army command communications system are linked together by multichannel radio and wire facilities provided by the two command radio companies of the army command signal radio and cable battalion. One company is stationed at army main and the other at army alternate. Each company provides both terminals of the link (with the exception of the link between army main and army alternate) it establishes. In the link between army main and army alternate, each company provides the terminal at its location. Army provided multichannel terminals located at the headquarters of units subordinate to field army headquarters will be connected to

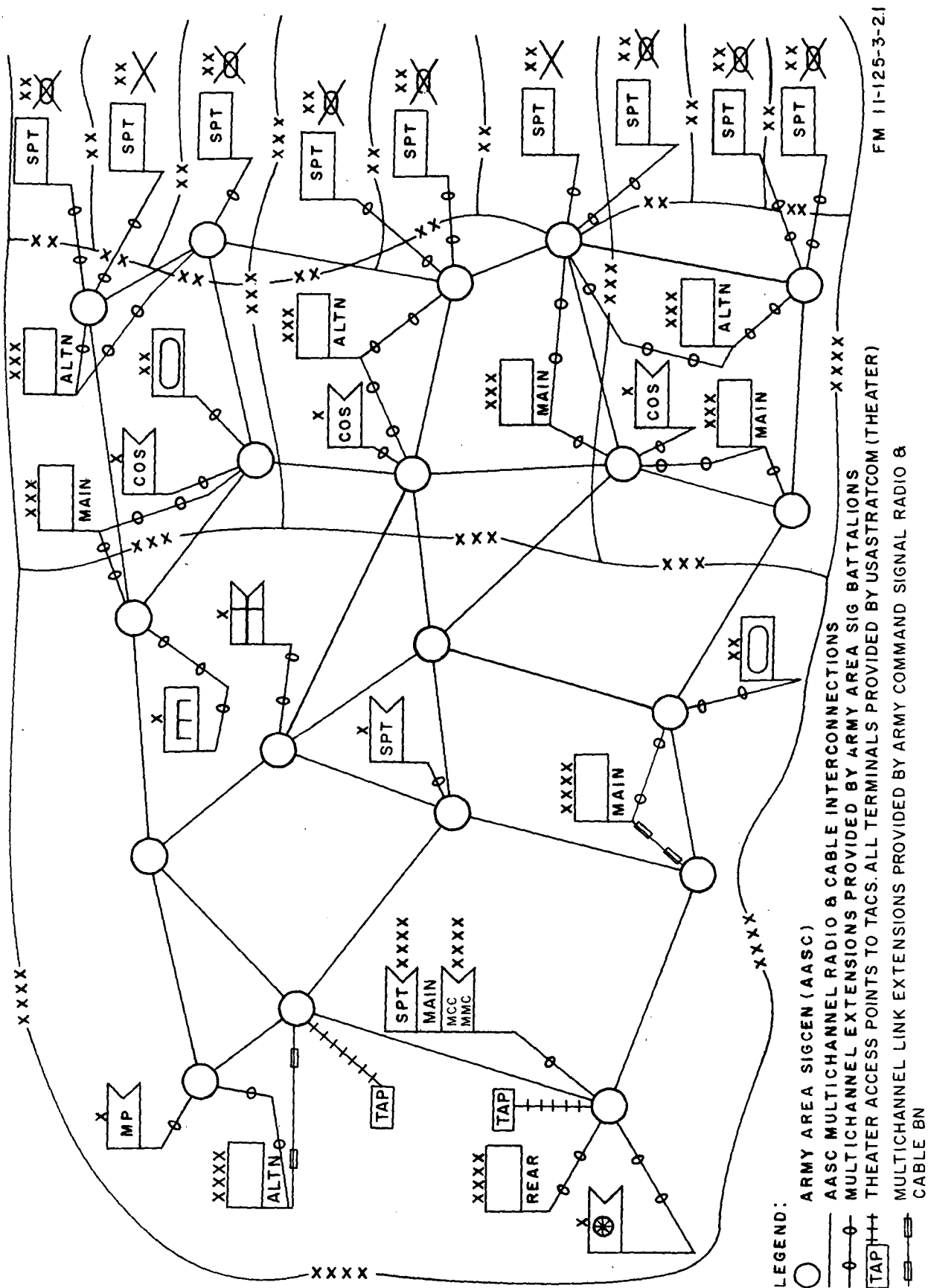


Figure 3-2. Type Army area communications system.

the technical control center patching panel or switchboard of the unit by cable and wire teams of the cable and wire company, radio and cable battalion. Thus, a multichannel link connecting field army headquarters to a subordinate headquarters is under the control of field army up to, but exclusive of, the patching panel or switchboard that is organic to the subordinate unit.

b. The command multichannel communications system (fig. 3-1 and 3-6) is engineered to provide voice, teletypewriter, facsimile, and digital communications channels as follows:

(1) *Twenty-four channels.*

- (a) Army main to army alternate.
- (b) Army main to corps main.
- (c) Army alternate to corps alternate.

★(d) Army main and alternate to AA-SC.

(2) *Twelve channels.*

(a) Army main and alternate to army rear.

(b) Army main and alternate to the main or alternate command posts of major subordinate units (less corps).

(c) Army main and alternate to the main or alternate command posts of field army support command (FASCOM).

★c. In addition to the command multichannel facilities established by the two command radio companies, extension links are also established between army main and an army area signal center and army alternate and an area signal center. Both terminals of these extension links are provided by the signal army area company responsible for the operations of the area signal center. As illustrated in figure 3-2, multichannel links (usually 12-channels) are established by the area signal company as follows:

(1) From an area signal center to army main.

(2) From an area signal center to army alternate.

(3) From one area signal center to army rear.

d. If these links are insufficient to carry the required traffic, additional links must be installed by the signal army area company. For information relative to the army area communications system, refer to paragraphs 3-25 through 3-36.

e. The main and alternate command posts of army headquarters are each connected by multi-

channel communications links to theater army main and alternate (when required) command posts. The headquarters of FASCOM and TASCOM are also interconnected by multichannel links. The field army terminals for these links with the TACS are installed, operated, and maintained by the United States Army Strategic Communications Command (theater). Refer to FM 24-1 and FM 11-23 for further information on theater army communications.

3-17. Cable and Wire Installation

a. The command cable and wire company (TOE 11-78) of the command radio and cable battalion provides for the installation and maintenance of field cable and field wire between the communications equipment configurations and the patching panels installed by the battalion. The company is also capable of installing cable and wire between the echelons of a field army headquarters and between these echelons and subordinate units as backup for the multichannel communications if the tactical situation permits such installation. The mission of the cable and wire company is to install and maintain field cable and field wire between multichannel terminals and the communications patching panels at army and corps command post locations. Refer to Part Two for detailed information on the capabilities and limitations of the command radio and cable battalion.

b. The command signal operations battalion has the capability of providing cable and wire connections between its organic communications terminal equipments and patching panels and between certain terminal equipment and patching panels and those patching panels installed by the signal radio and cable battalion.

c. Both the radio and cable battalion and the signal operations battalion have the organic equipment and assigned personnel to provide their internal wire communications.

3-18. High-Frequency Radio Communications Linking Command Signal Centers

a. In addition to the multichannel facilities linking command signal centers, high-frequency radio systems are installed to provide an alternate means of communications.

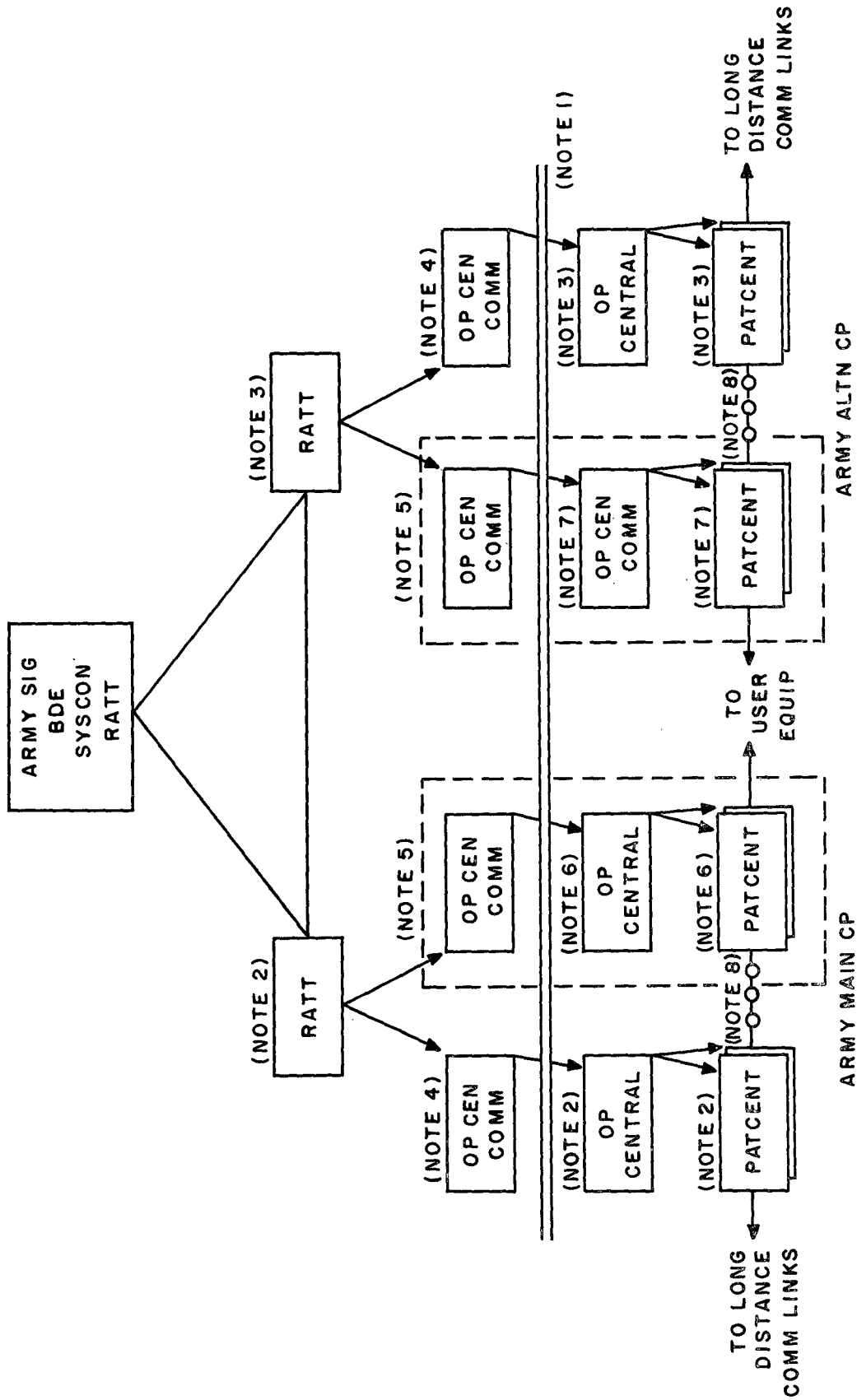
★b. The command radio company establishes a command radio link to a subordinate headquarters and provides the radio station at the sub-

ordinate headquarters. The radio stations at army main are designated net control stations (NCS); those at army alternate are designated as subordinate stations with the added responsibility of assuming control of the net in the event of damage, destruction, or other loss to the facilities at army main.

c. The radio equipment provided by the two radio companies are shelter-installed, truck-mounted, radio transmitter sets and radio receiver sets. These radio sets are capable of providing secure HF radioteletypewriter (RATT), voice, and radiotelegraph (CW) service. Normally, each transmitter set contains three HF radio transmitters and associated teletypewriter equipment; each receiving set contains eight radio receivers which, when used in conjunction with the transmitters, are capable of providing full-duplex radio links for use as described in paragraph 3-19.

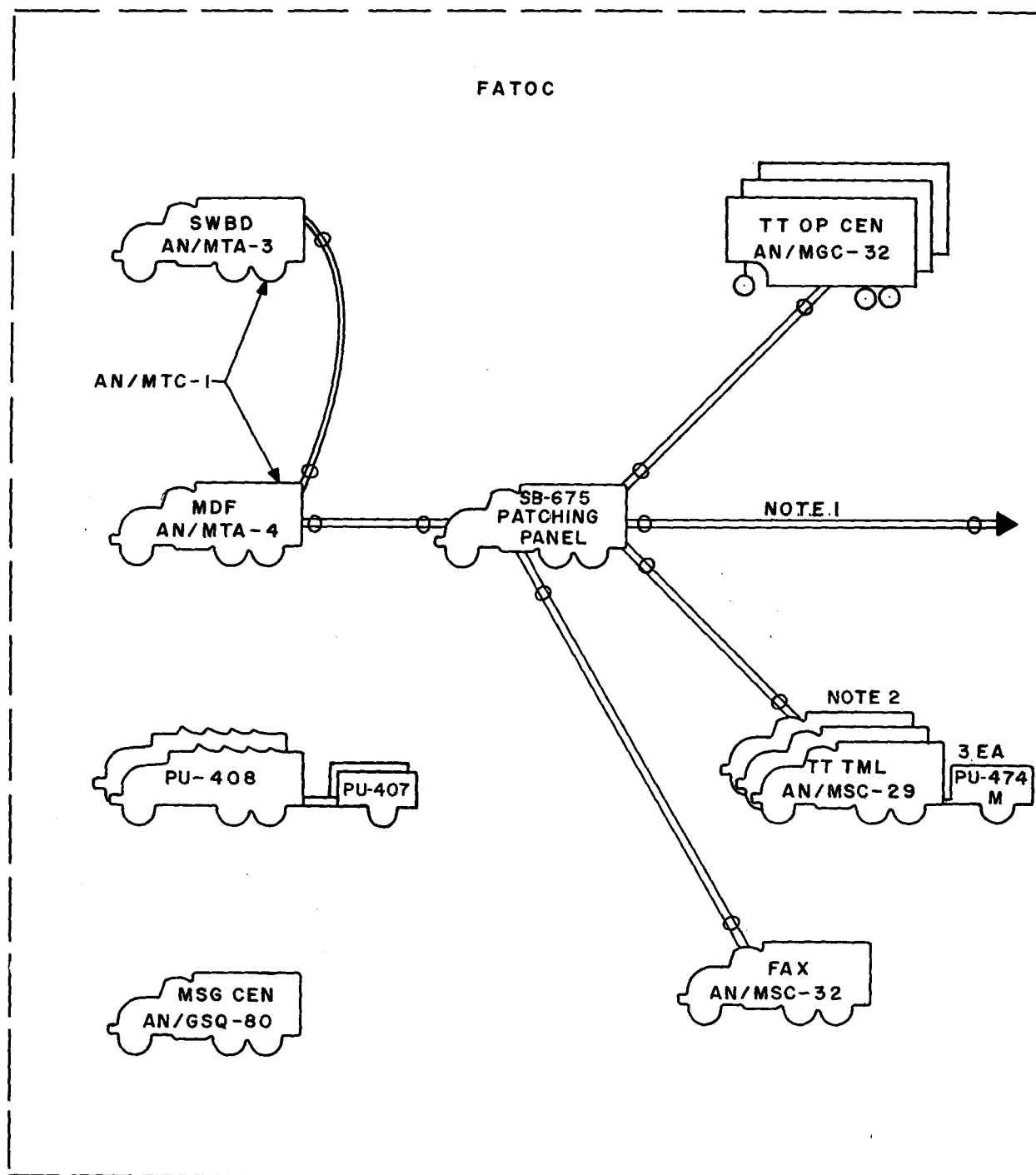
★d. Separate transmitter and receiver parks

normally are established in the vicinity of each echelon of army headquarters (exclusive of Army rear) (fig. 13-2). These parks are separated from each other and from the echelon of the associated command post to reduce mutual interference between transmitters and receivers. Establishment of these parks may require a number of long keying lines between the radio sets in each park and the communications center facility from which these keying lines originate. The keying circuits may be radio/carrier, cable/carrier, or radio. A keying circuit is an electrical path between a radio set and a remote site from which the radio is operated. To reduce the number of individual keying lines required in high density areas, a single multipair cable, either aerial or buried, preferably 22 AWG plastic covered, is frequently used. These multichannel keying facilities are illustrated in figure 3-6 and described in greater detail in Part Two of this manual.



FM 11-125-3-3

Figure 3-3. Type field army command communications systems control and technical control facilities.

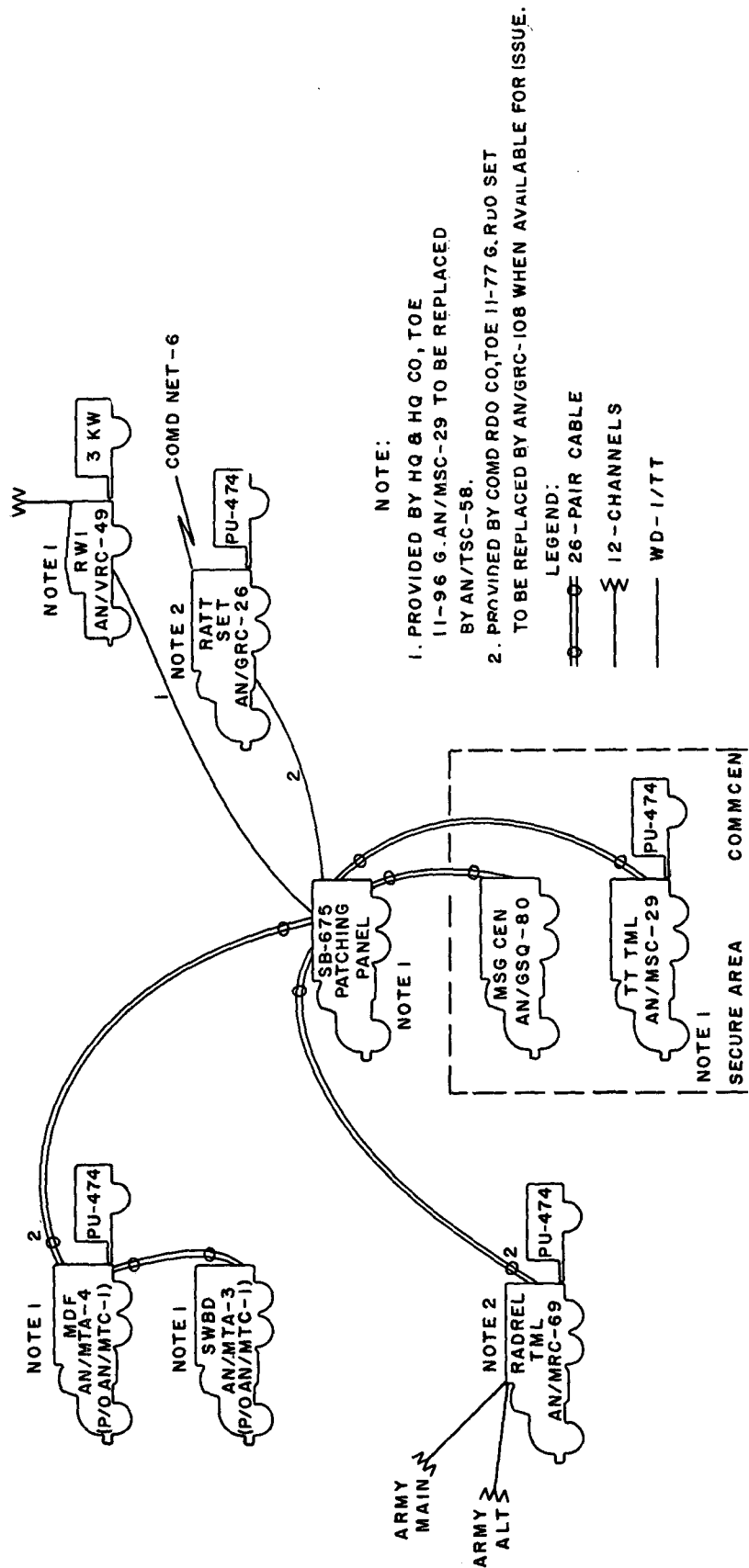


NOTE:

1. 26-PAIR CABLE CONNECTS TO SB-675 FURNISHED BY A RADIO CO; TOE 11-77.
2. TO BE REPLACED BY AN/TSC-58 WHEN AVAILABLE.

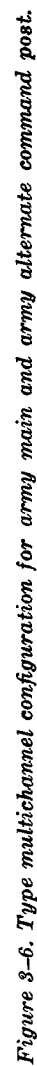
FM 11-125-3-4

Figure 3-4. Type FATOC communications facilities configuration.



FM 11-125-3-5

Figure 8-5. Type configuration of communications facilities at army rear command post.



UNITS	ARMY COMD NET-1	ARMY COMD NET-2	ARMY COMD NET-3	ARMY COMD NET-4	ARMY COMD NET-5	ARMY COMD NET-6	ARMY-AJA ARMY LN NET	SIG BDE COMD & CON NET	ARMY AIR REQ NET-1	ARMY AIR REQ NET-2	ARMY AIR REQ NET-3	ARMY AIR REQ NET-4	ARMY GLO NET
ARMY MAIN	MRR-8 & MRT-9	MRR-8 & MRT-9	MRR-8 & MRT-9	MRR-8 & MRT-9	MRR-8 & MRT-9	MRR-8 & MRT-9	GRC-26		MRR-8 & MRT-9	MRR-8 & MRT-9	MRR-8 & MRT-9	GRC-26	GRC-26
ARMY ALTN	MRR-8 & MRT-9	MRR-8 & MRT-9	MRR-8 & MRT-9	MRR-8 & MRT-9	MRR-8 & MRT-9	MRR-8 & MRT-9	GRC-26		MRR-8 & MRT-9	MRR-8 & MRT-9	MRR-8 & MRT-9	GRC-26	GRC-26
1 ST CORPS	GRC-26												
2 ND CORPS		GRC-26											
3 RD CORPS			GRC-26										
RESERVE DIV				GRC-26								GRC-26	
ARMED CAV				GRC-26									
SEP BDE				GRC-26									
FLD ARTY					GRC-26								
ADA					GRC-26								
INTEL GP					GRC-26								
AVN					GRC-26								
AIR CAV					GRC-26								
ARMY REAR						GRC-26							
FASCOM HQ						GRC-26							
ENG BDE						GRC-26							
CHEM						GRC-26							
ASA					GRC-26								
SIG BDE								GRC-26					
COMD OP BN								GRC-26					
RDO & CABLE BN								GRC-26					
SIG ARMY AREA BN								GRC-142					
ADJACENT							GRC-26						
ARMY MAIN							GRC-26						
ADJACENT							GRC-26						
ARMY ALTN													
3 DIVS OF 1 ST CORPS									GRC-26				
3 DIVS OF 2 ND CORPS										GRC-26			
3 DIVS OF 3 RD CORPS											GRC-26		
AF TAC													GRC-26
AIR FLD													

FM 11-125-3-7

Figure 3-7. Type army command radio nets.

3-19. Army Command Nets

a. The command radio company at army main and the radio company at army alternate provides each of these echelons with two radio transmitter sets and two radio receiver sets for use in establishing six army command nets. Army command nets are established on a full-duplex basis (traffic passing in both directions simultaneously) and include stations as follows:

(1) Army Command Net No. 1: Army main and alternate and the main command post of one of the three corps subordinate to army. (Corps alternate command posts do not have stations in army command nets.)

(2) Army Command Net No. 2: Army main and alternate and the main command post of the second of the three corps subordinate to army.

(3) Army Command Net No. 3: Army main and alternate and the main command post of the third of the three corps subordinate to army.

(4) Army Command Net No. 4: Army main and alternate, armored cavalry regiment, a reserve division, and a separate brigade.

(5) Army Command Net No. 5: Army main and alternate, Pershing field artillery battalion, the air defense artillery brigade, the military intelligence group, aviation group, air cavalry squadron, and the army security element in support of field army headquarters.

(6) Army Command Net No. 6: Army main and alternate, army rear, FASCOM main, engineer brigade, and the chemical brigade.

b. In addition to the six command nets, army main and alternate are both linked in a liaison net with the main and alternate command posts of an adjacent army. The radio company at army main provides the station at army main and the station at the main echelon of the adjacent army CP. Similarly, the company at army alternate provides both stations of the link it establishes with the alternate echelon of the adjacent army. Figure 3-7 graphically illustrates the army command nets.

c. Each radio company is also provided with eight radio sets AN/GRC-26 for use as the station at the subordinate headquarters. This radio set is a truck-mounted, self-contained assemblage (radio transmitter, receivers, and associated teleprinter equipment) installed in a shelter. A trailer-mounted generator set furnishes the required electrical power.

3-20. Army Air Request Nets

In addition to the army command nets described in paragraph 3-19 radio nets are also established at the main and alternate echelons of army headquarters for preplanned air requests. For a discussion of air-ground communications, refer to FM 61-100 and FM 100-5. These army air request nets are used to provide a direct means of communications between the main and alternate command posts of army and the tactical operations centers at the main command post of each corps and the main command post of those divisions subordinate to corps. Each command radio company provides either army main or alternate with a radio transmitter set AN/MRT-9, a radio receiver set AN/MRR-8, and a radio set AN/GRC-26. The radio stations at corps main are provided by the corps signal battalions assigned to each corps, while the station at each division main is provided by the division signal battalion supporting the division. It should be noted (fig. 3-7) that the radio stations at corps and divisions are not provided by the army command signal radio companies but are organic to the signal units terminating these links with army headquarters. The AN/MRT-9, in conjunction with the AN/MRR-8, is used to establish three of the four nets; the AN/GRC-26 is used to establish the fourth net. Army air request nets and subordinate stations in these nets are indicated below:

a. Army air request net No. 1: Army main and alternate, corps main of one of three corps and the main CP of those divisions subordinate to the corps.

b. Army air request net No. 2: Army main and alternate, corps main of the second of three corps and the main CP of those divisions subordinate to the corps.

c. Army air request net No. 3: Army main and alternate, the corps main of the third of the three corps and the main echelon of those divisions subordinate to the corps.

d. Army air request net No. 4: Army main and alternate and the main command posts of the divisions in army reserve.

3-21. Immediate Air Request Nets

Radio nets for immediate air requests from the Air Force are a responsibility of the United States Air Force. For information on this subject, see FM 100-15 or FM 61-100.

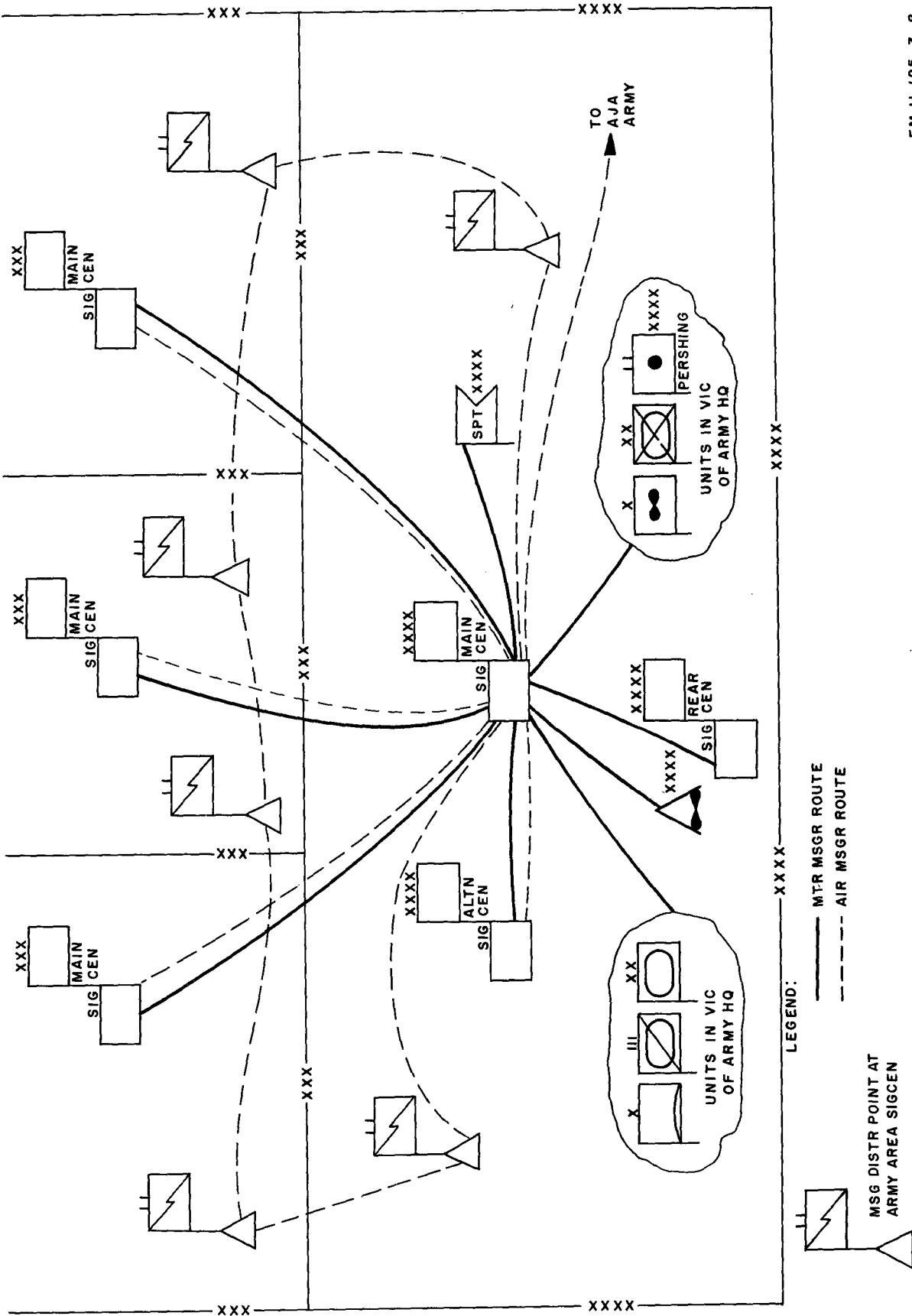


Figure 3-8. Type air and motor messenger configuration for service to the field army headquarters.

3-22. Messenger Service, Field Army Command Communications System

a. The army command signal operations battalion provides scheduled and special air and motor messenger service (fig. 3-8) and limited aircraft for air courier service. Designated personnel to act as air couriers are provided by the Adjutant General. Messenger service between a command signal center and an area signal center is normally provided by personnel of the command signal center. For messenger service between area signal centers refer to (paragraphs 3-25 through 3-36).

(1) Scheduled messengers adhere to a schedule prepared by the systems control center of the signal battalion responsible for the operations of the command signal center.

(2) Special messengers (including couriers) augment the scheduled messenger service and also provide service to units that are not on a scheduled route. Special messengers are also used to deliver high precedence traffic that requires special processing; to deliver bulky material such as charts, maps, overlays, diagrams, and photographs and to reduce the traffic load on electrical means of communications. AG designated carriers are employed for the transmission of TOP SECRET information when it is sent in the clear.

b. The two communications center companies have message processing and messenger dispatching facilities to provide motor and air messenger service between the echelons of field army headquarters and from these echelons to appropriate echelons of major subordinate units. The company located at army main provides service between army main and the main command posts of designated major subordinate units and to designated army area signal centers. The company at army alternate provides the service between army alternate and the alternate command posts of designated major subordinate units and to designated army area signal centers. Local distribution of traffic processed through COMMCEN facilities of the command system is a responsibility of the Adjutant General section. COMMCEN personnel will deliver terminating traffic to and receipt for originating traffic from the AG distribution center.

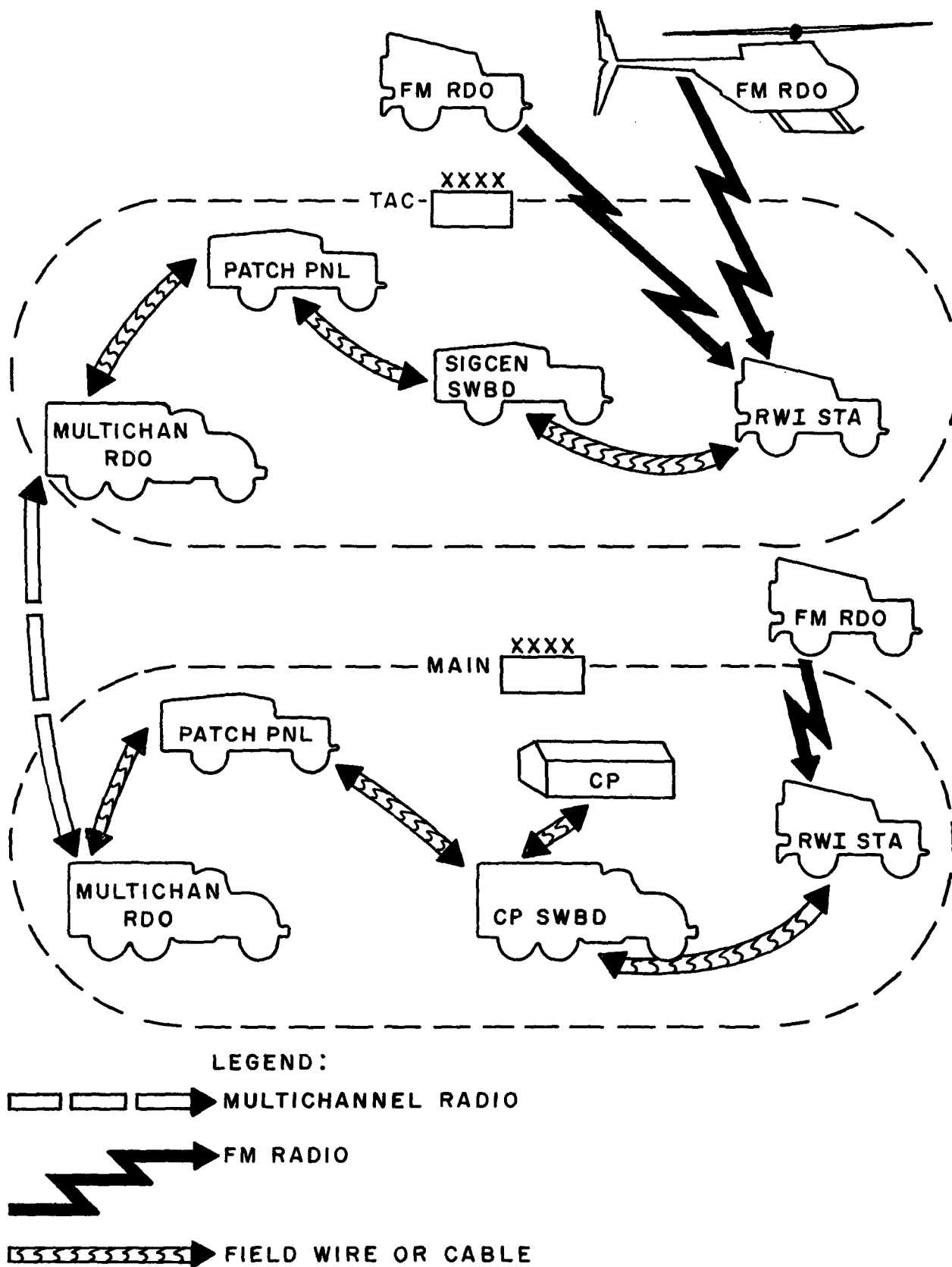
c. The aviation section, headquarters and headquarters company, army command signal operations battalion, provides the personnel and equipment to operate the air-messenger service for army headquarters. Three fixed-wing aircraft

(U-8F), and three rotary-wing aircraft (one UH-1D) and (two OH-6) are provided the section for this purpose. Depending on climatic conditions, air-messenger service provides a swift means of delivering messages and packages between the echelons of field army headquarters and major subordinate units; between field army headquarters and adjacent field armies; and between field army headquarters and the army area signal battalions that are assigned to the field army signal brigade. Air messengers are particularly suitable when the distances between headquarters are extensive, when trafficability is poor, or when vehicles are subject to ambush, landmines, or artillery fire. Normally, air-messenger service terminates at the airfield in the vicinity of the supported headquarters. Communications center personnel of the supported headquarters are responsible to deliver and pick up air-messenger traffic at the airfield for subsequent delivery to the AG distribution center. In the event additional aircraft are required for special or emergency reasons, the signal brigade aviation officer will make arrangements for additional assistance.

3-23. Radio Wire Integration Facilities

a. The main, alternate, and rear echelons of army headquarters are provided with a radio wire integration station. The RWI station consists of an FM radio set connected to wire communications equipment in a manner that will permit a commander to maintain communications with the command post (fig. 3-9). Thus, a commander or staff member who is airborne, and within radio range of the CP, may communicate by radio with the RWI station located in the command post area and, through the telephone system, be connected with whomever he wishes to communicate. Conversely, a staff member in the command post may use the RWI facility to call and communicate with any individual equipped with a radio that is compatible with and in range of the RWI station.

b. An RWI station consists of a frequency-modulated radio set and a radio control set installed in a shelter which is truck mounted. Normally, the equipment is operated with power provided by the vehicular electrical source; however, a small gasoline-engine-driven power generator is provided for extended periods of operation. A field wire line is used to connect the radio control set with a switchboard (SB-22) or Accessory Kit MX-2915/PT, which may be located either at the radio set or at the main switchboard in the CP area. Thus connected, the RWI station becomes,



FM 11-125-3-9

Figure 3-9. Type radio wire integration facility.

in effect a telephone subscriber line with a radio link replacing a part of the field wire line normally associated with a wire system.

c. One radio company provides an RWI facility at army main; the other company provides the facility for army alternate. RWI service at army rear is provided by the army rear operations platoon (para 3-15).

d. Since radio is used in establishing a radio wire integrated circuit, both the called and calling parties must be cautioned by the switchboard operator to use normal radiotelephone procedure and to adhere to security measures associated with and normal for voice radio communications.

e. Figure 3-9 illustrates a type configuration of RWI facilities. Detailed information is provided in part two of this manual.

★3-24. Communications Centers

a. The communications center company located at army main installs and operates a communications center (COMM-CEN) as an integral part of the signal center supporting army main. The company at army alternate provides a similar function for army alternate. The communications center in support of army rear is provided as indicated in paragraph 3-15. Each communications center is responsible for the receipt, transmission, and delivery of messages and, as a minimum, includes a message center, a cryptocenter, and receiving and transmitting

facilities such as HF radio (RATT and voice), teletypewriter, messenger dispatching, and facsimile. The HF radio facilities which comprise the army command nets (para 3-18) may be operated by remote control from the communications center. Messengers may be dispatched to the radio parks to deliver outgoing and receive incoming traffic, because the MRR-8's and MRT-9's do not contain teletypewriter equipment for each net.

b. Each communications center company is provided with adequate equipment and facilities to operate a major tape relay station in the tape relay system. The tape relay operations at these two command signal centers should be independent of the teletypewriter terminal operations. Direct tape relay circuits will be established between the command tape relay stations at army main and army alternate, and from these echelons to the appropriate echelons of higher, lower, and lateral headquarters. It should be noted that command relay stations are designed to provide teletypewriter service for the headquarters they serve. They should not be used as primary routes to units in the field army area that are not otherwise serviced by the command headquarters. The facilities of the army area communications system should be used for this purpose.

c. Army rear is provided with a teletypewriter terminal. This facility is used to terminate teletypewriter circuits from army main and alternate, and from at least one army area signal center.

Section IV. ARMY AREA COMMUNICATIONS SYSTEM

★3-25. General

a. The army area communications system (fig. 3-2) consists of army area signal centers (AA-SC) installed throughout the field army area. The system transcends command boundaries and normally is limited to the area between the army rear and the division rear boundaries. On occasion, an army area signal center may be located in the forward area of the communications zone (COMMZ) or in a division rear area. Major headquarters should be provided circuits to at least two area signal centers to reduce the possibility of complete disruption of service due to enemy action or failure of equipment. Smaller headquarters, units, and installations will be provided circuits to one area signal center. Area

signal centers are interconnected by cable or by multichannel radio and wire systems or by a combination of both. Thus, the entire field army area of operations is covered by a lattice of multichannel radio, and wire and cable trunks interconnecting area signal centers. Military headquarters, units, and installations in the vicinity of an area signal center are authorized use of the area communications system on a common-user basis. However, when properly justified, authorization may be obtained from the army commander for the allocation of sole-user or dedicated circuits.

b. Each area signal center provides message center, telephone, teletypewriter, and radio wire integration (RWI) service for those units lo-

cated in the general vicinity. Messenger service between area signal centers is also provided. Entrance into the theater army communications systems (TACS) is provided by the United States Army Strategic Communications Command (US-ASTRATCOM).

c. Army area signal centers are not associated with any particular unit, headquarters, or command post, but provide communications support to all troops located in the area. The location of an area signal center is governed by local geography, lines of communication, troop population, enemy capability and other tactical and logistical considerations.

d. The command communications systems of field armies and corps are connected to the army area communications system with multichannel radio links provided by signal personnel operating the area signal center. If time, distance, and tactical situation permit, multichannel cable links may also be installed. Each area signal center is provided with a limited number of multichannel terminals and operating personnel to install and operate both terminals of the link it establishes with these command systems. The links established between an area signal center and a user of the area communications system are called *extension or access* links because they extend the facilities of the area communications system to the user or provide access into the area system. The army area communications system is also connected to the division communications system by means of multichannel radio or wire links or with field wire or cable. Entrance into the theater Army communications systems (TACS) is provided by the United States Army Strategic Communications Command (US-ASTRATCOM).

★3-26. Concept of System Installation

a. The number of signal centers deployed depends on the field army force structure and the number of units to be supported. The system will be installed, operated, and maintained by the signal army area battalions assigned to the army signal brigade.

b. Each signal army area battalion has the capability of installing and operating four army area signal centers. Each center is installed and operated by one of the four area signal companies which are organic to the battalion. Normally, these battalions are located on a left-to-right (lateral) axis with each company on a

rear-to-front (longitudinal axis) in order to facilitate displacement.

3-27. Facilities Provided

Each army area signal center furnishes multichannel radio and wire facilities and local field wire and cable circuits to units in the vicinity requiring the service. Each area signal center also—

a. Furnishes telephone, message center, teletypewriter, and cryptographic service for units and installations in the area.

b. Provides patching and switching of telephone and teletypewriter circuits.

c. Provides radio wire integration service.

★d. Provides messenger service between area signal centers.

3-28. Coordination Between Command and Area Signal Centers

Each army area signal center must maintain close coordination with the major headquarters to which circuits are established.

a. Multichannel links between any army area signal center and a command signal center at each echelon of field army and corps headquarters will be established by the signal army area company operating the army area signal center. The area signal company will furnish operating personnel and terminal equipment at both ends of the link.

★b. The signal army area company will also provide the personnel and terminal equipment to connect the area signal center with the division support command and with division rear. These multichannel links are in addition to the command links established by the corps signal battalion between corps and division main and corps and division alternate.

3-29. Multichannel Links Connecting Area Signal Centers

a. The area signal centers comprising the army area communications system are linked together with multichannel radio and/or wire trunks (para 3-25). The number of trunks connecting signal centers are dependent on the volume and the nature of the traffic passing through the communications system.

b. The multichannel radio and wire terminals

linking area signal centers together are connected by cable to the centrally located patching panel used by the technical control center in each signal center area. The technical control center provides a ready means of patching trunks together to provide the desired routing to and between area signal centers and to the signal facilities described in the following paragraphs.

c. Each area signal company is provided with sufficient multichannel equipment to terminate 12 multichannel signal systems. Area signal centers will be connected to at least two adjacent area signal centers.

3-30. Multichannel Repeaters

a. Occasions may arise when the distances between signal centers are beyond the range of the multichannel radio equipment. Intervening terrain features and vegetation may also attenuate radio signals. Multichannel repeater sets may be used on both multichannel radio or wire links. When used in tandem, more than one repeater site between terminals, communications of up to 320 kilometers are possible before communications become impossible.

b. Each Army area signal center has been furnished with four multichannel radio repeater sets for use on links which could not otherwise be established. These repeater sets, the shelter-installed, truck-mounted AN/MRC-54, are each capable of providing a repeater capability for a 12-channel radio link; therefore, two repeater sets will be required at each repeater site if 24-channel linkage is to be installed. Distances between signal centers may be extended by installing two repeater sites on a 12-channel link.

3-31. Telephone Service

Each army area signal center is furnished with a shelter-installed, truck-mounted, manually operated telephone central office capable of providing telephone service for approximately 200 subscriber lines. This switchboard is connected by cable to either a distribution box or a patching panel in the signal center area, and, in turn, to the technical control center in the access terminal area. From the technical control center in the access terminal area, connections are made to either the transmission center (for entry into the long-distance telephone communications system) or to those units in the vicinity who require local telephone service.

★3-32. Teletypewriter Services

Each army area signal center is provided with a capability of establishing a major tape relay in the army tape relay system. Each signal army area company is provided with a teletypewriter terminal. Augmentation of this equipment is provided by headquarters and headquarters company signal army area battalion as requirements demand. The headquarters company is provided with one teletypewriter central office and two teletypewriter operations centrals.

a. Each teletypewriter central office provides facilities for terminating or interconnecting 120-voice frequency circuits. Operator's facilities permit switching of either teletypewriter or telephone circuits.

b. Each telegraph terminal provides facilities for receiving and transmitting messages. Six teletypewriter reperforator transmitters provide three full-duplex circuits. Six communications security equipments have the capability of providing six half-duplex secure circuits or three full-duplex secure circuits and three full-duplex nonsecure circuits when used in conjunction with the reperforator transmitters. Page printing is also provided by six teletypewriters.

c. The voice frequency telegraph switching center provides terminating facilities for teletypewriter traffic on secure circuits and for switching teletypewriter circuits. Facilities are also provided for tape and keyboard transmission and for tape and page reception. Operation on two half-duplex secure circuits or one full-duplex secure circuit and one full-duplex nonsecure circuit is possible. Switching of 12 circuits is possible by using the switchboard provided.

d. Each teletypewriter operations center provides a tape relay facility for 10 half-duplex secure circuits or 5 full-duplex secure circuits and 5 full-duplex nonsecure circuits.

3-33. Messenger Service

a. The field army *command* communications system employs scheduled air and motor messengers between the echelons of the field army headquarters and the echelons of major subordinate units; and to pouch distribution centers (para 3-34).

b. The field army *area* communications system normally employs motor messengers between area signal centers. These motor messengers pro-

vided by the headquarters and headquarters company of each signal army area battalion, operate between the area signal centers organic to the battalion. Lateral messenger service between signal centers not under the same area signal battalion will be established by the area signal battalion designated by the SYSCONCEN of the army signal brigade.

3-34. Pouch Distribution Centers

a. The headquarters and headquarters company of each army area signal battalion will establish a pouch distribution center for the delivery of message traffic between headquarters, units, or area signal centers when the volume of traffic is such that individual message processing at intermediate points is impractical.

b. Pouches are prepared by the originating signal center, picked up by the battalion messenger teams, carried to the battalion pouch distribution center, and there routed to the destination. The battalion pouch distribution center, normally collocated with the message center of an organic company, should not be confused with the functions of the AG distribution center.

3-35. Concept of Messenger Operations

Units and headquarters satellited on an area signal center for messenger service are responsible for the receipt and transmission of messages to the signal center.

a. Message traffic processed through area signal centers under the same area signal battalion will be transmitted to the pouch distribution center by messenger personnel organic to the area signal battalion.

b. Message traffic processed through area signal centers not under the same area signal battalion will be transmitted to pouch distribution centers by motor messengers of the area signal battalion designated by the SYSCONCEN army signal brigade.

c. Message traffic between an area signal center and an echelon of army headquarters will be transmitted to a pouch distribution center where it will be picked up by messenger personnel of the army signal command operations battalion, operating the messenger service in the field army command communications systems.

d. Messenger service between echelons of corps and division headquarters and an army area signal center is the responsibility of the corps and division, respectively. In certain instances, however, this responsibility may be assumed by the area signal battalion. This determination will be made through coordination with the SYSCONCEN of the army signal brigade.

3-36. Air Messenger Service

Signal army area battalions are not provided with sufficient aircraft to establish air messenger service between area signal centers on a scheduled basis. However, the field army air messenger service that is operated by the army command signal operations battalion provides scheduled air messenger service to designated message distribution centers (fig. 3-8). The systems control center of the army signal brigade, in coordination with the brigade aviation officer and the S3 of each battalion, may establish a nonscheduled air messenger pickup and delivery service with available resources.

Section V. CONTROL OF FIELD ARMY COMMUNICATIONS SYSTEMS

3-37. General

a. The army signal brigade has the responsibility of operating and controlling both the army command and the army area communications systems. The signal brigade commander is assisted in this task by his staff and the systems control and technical control facilities organic to several elements of the signal brigade. The systems control center at the brigade passes signal orders and directives to and receives information from the systems control centers of the various oper-

ating battalions. These systems control centers, in turn, translate these orders and directives and pass them to the collocated technical control centers for implementation. Responsibilities for accomplishing circuit installation or circuit restoral are delegated to the lowest operating element as possible. In the command system, the majority of circuit requirements are fixed, known in advance, and subject to little change. These requirements are included in the standing operating procedure of the responsible units. Although circuit require-

ments in the area system are subject to more change than those of the command system, circuit installation and restoral, when requested, will be installed by the area signal center serving the subscriber, if available resources permit. If resources are not available, the request will be forwarded to the appropriate battalion system control center for necessary action. In either case, the battalion systems control center will be notified of whatever action is taken.

b. The following definitions are included for clarification purposes and will govern references made to systems and technical control functions throughout this manual:

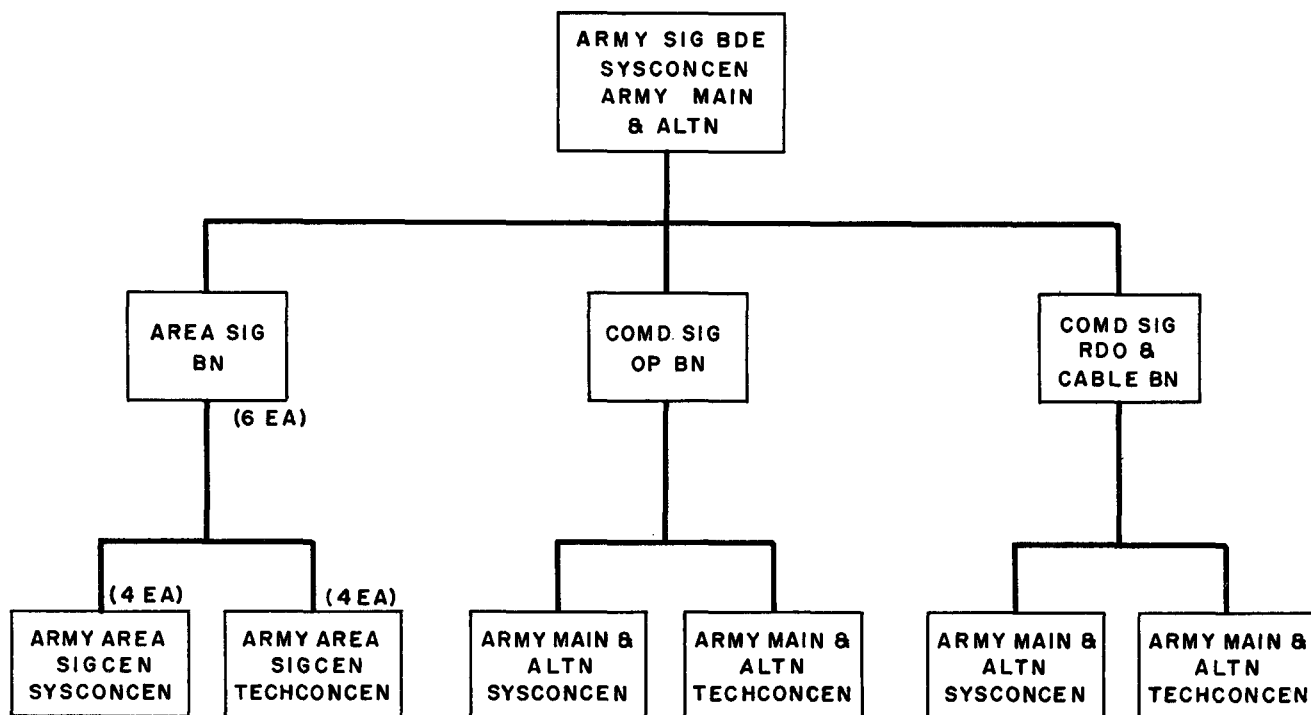
(1) Systems control (SYSCON) is the command, control, and management of signal facilities to fulfill signal requirements, and consists primarily of supervising and planning of signal communications necessary to support tactical operations.

(2) Systems control center is a central communications activity established by a Signal Corps unit to accomplish detailed signal system planning and engineering to include traffic analysis and traffic engineering. Coordinates, directs, and

controls the implementation, integration, and operation of a signal communications system to include allocation of radio frequencies. Provides signal information service. Operational control normally is exercised through subordinate systems control and technical centers.

(3) Technical control (TECHCON) is the technical management and/or control exercised over signal communications and includes the functions of establishing, routing rerouting patching, and discontinuing communications circuits in a signal communications system.

(4) Technical control center (TECHCONCEN) is a communications work area containing distribution frames and associated jacks or switches through which equipment and facilities are patched to arrange the desired circuit. The center is charged with the responsibility of maintaining optimum performance of teletypewriter, data, telephone, and radio circuitry. Various types of test equipment are utilized in exercising circuit/facility quality control. Technical control centers coordinate the routing of circuits within their assigned portion of the communications system.



FM 11-125-3-10

Figure 3-10. Type systems control and technical control facilities of an army area signal brigade.

3-38. Coordination Between Systems Control and Technical Control Centers

Figure 3-10 illustrates a type configuration of systems and technical control centers of the signal brigade. The army signal brigade has a SYSCONCEN at both the main and alternate echelons of the field army headquarters. The command signal operations battalion and the command signal radio and cable battalion have a systems control center and a technical control center at these echelons. The army area signal battalions establish a SYSCONCEN and a TECHCONCEN at each army area signal center. The control centers are operated by the companies of the battalions. The systems control centers usually establish circuit and restoral priorities, publish the telephone directory furnish information service, assign allocated frequencies, prepare ex-

tracts of signal operations instructions (SOI), and prepare standing operating procedures (SOP) used in controlling the communications system. To provide technical control centers with the maximum time in which to react, systems control centers must provide a comprehensive and carefully prepared SOP. These procedures must clearly define the parameters within which the technical control centers may operate without recourse to the systems control centers. Systems control centers must delegate as many of the detailed and routine operations as possible to the technical control centers, but still retain the systems control functions of planning, supervising, and recording the status of the communications system. Further information on the detailed operation and duties of the systems and technical control centers is presented in Part Two of this manual.

Section VI. ARMY-WIDE TAPE RELAY SYSTEM

3-39. Introduction

Since the army-wide tape relay network transcends the field army, corps and division boundaries and encompasses major portions of the communications systems organic to these organizations, the tape relay system is discussed in this section as a separate topic.

3-40. General

a. The army-wide tape relay system provides a network of tape relay, terminal and tributary stations located at signal centers which are connected together by multichannel radio and/or wire links. These links provide a lattice of FDX circuits capable of furnishing main teletypewriter traffic routes to move high volumes of fast-moving traffic over long distances. Circuits normally are connected point-to-point (station-to-station, as opposed to switching): however, a teletypewriter trunk switching capability may be provided, if necessary, from resources available to the theater army commander.

b. Signal units establishing command and area signal centers in the field army, corps and division communications system furnish the teletypewriter stations necessary to establish the tape relay system. In addition, signal units assigned or attached to the various headquarters of the field army support command (FASCOM) also establish stations in the system when directed by the COMMEL staff officer.

c. The torn tape method of transmitting message traffic is employed within the field army tape relay system (as opposed to a fully automatic system). Traffic at a relay station is received in tape form on a teletypewriter terminating an incoming trunk, removed (torn), processed, and placed on a teletypewriter connected to an outgoing trunk. Since tape relay stations receive and transmit messages in tape form only (except for certain service messages), terminal and/or tributary stations are required to provide a means of converting a written message to tape format or to convert a tape to the written format for either delivery or transmission through other systems (refile).

3-41. Classification of Teletypewriter Stations

Teletypewriter stations fall into three general categories: tape relay stations, teletypewriter terminal stations, and tributary stations.

a. Tape relay stations receive messages in tape form and transmit them in tape form to other stations in the system. Relay stations do not originate or terminate messages (except as noted above) nor do they process page copy. Tape relay stations are further classified as either a major or a minor station:

(1) A major relay is a station connected to at least two other relay stations, thus providing alternates routing.

(2) A minor relay is a station connected to only one other relay station. Provisions for alternating routing are not provided.

★*b.* Teletypewriter terminal stations have the primary responsibility of serving the tape relay station with which they are associated; they are generally located near or in the general vicinity of the tape relay station. Terminal stations have the added responsibility of processing messages for transmission, delivery, or refile for those units or headquarters in the vicinity requiring teletypewriter service. Message processing involves converting written messages into tape format (poking) for entry into the tape relay network; and, conversely, converting tape traffic into printed format for delivery to an AG distribution center, message center or to the addressee.

c. Tributary stations process messages for transmission, delivery or refile for headquarters and units not otherwise supported by a terminal station. A tributary station is closely associated and is generally located in or near the vicinity of the headquarters it supports. Normally, tributary stations do not perform functions for a relay station.

3-42. Concept of Operations

Specific procedures for processing and servicing tape relay traffic are found in ACP 127. However, in general terms, the tape relay procedure may be summarized as follows:

a. Written messages are delivered to a terminal or tributary station where they are converted to tape format and transmitted to a tape relay station.

★*b.* The tape relay station routes the messages through the tape relay station to the terminal/tributary station serving the addressee.

c. The terminal/tributary station receives the message, converts it to written form and arranges for its delivery.

★3-43. Field Army Tape Relay System

The field army tape relay system (fig 3-11) is integrated into the theater army (COMMZ) tape relay system; it extends from the army rear boundary forward to and including stations in the division communications system as indicated in paragraph 3-40. The theater army communications system (TACS) provides theater access

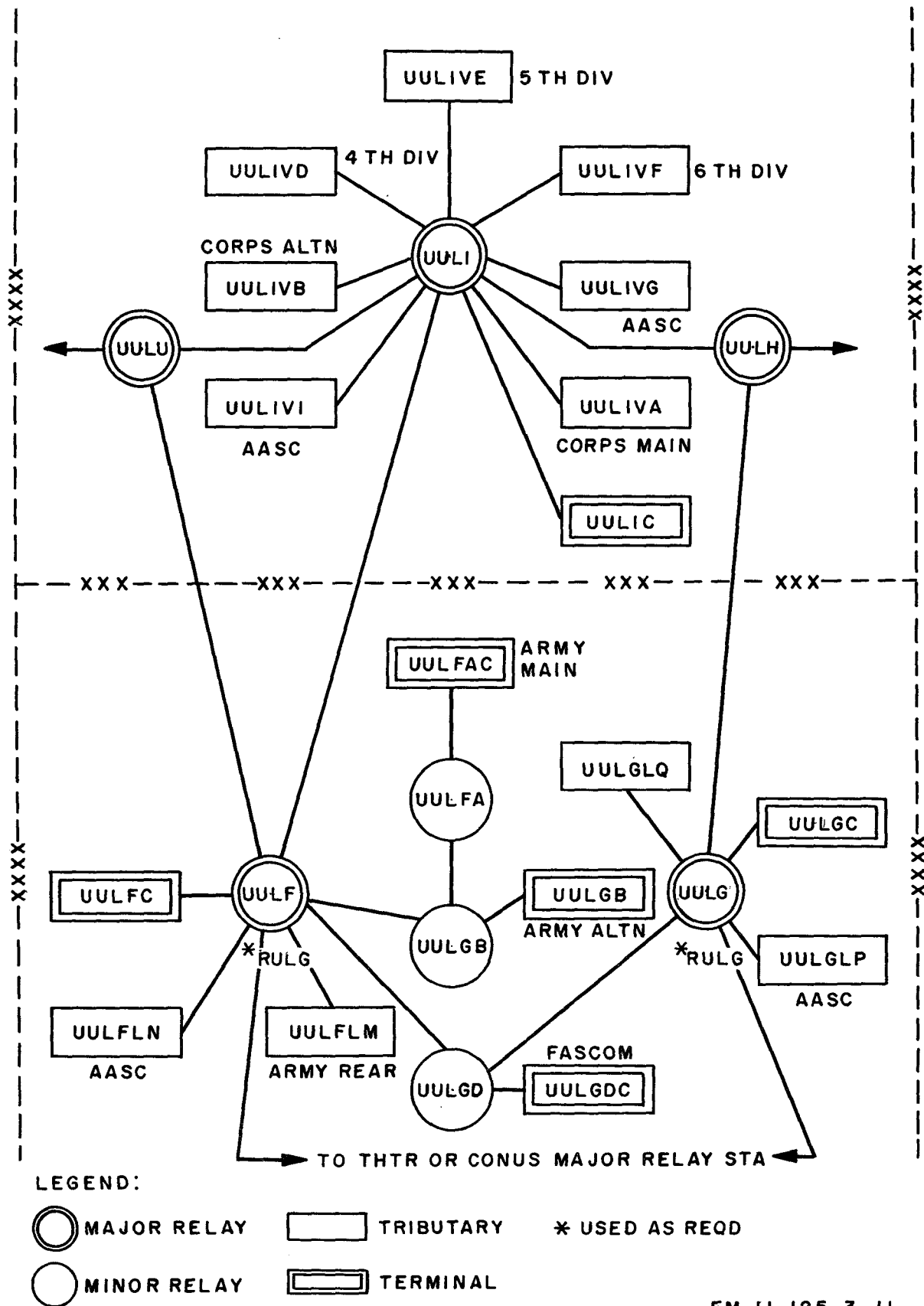
points (TAP) for the field army communications system. Two TAP's are provided and each connects to an Army area signal center located in the rear of the combat zone and in the vicinity of Army main and Army alternate.

a. Major relay stations are operated in the field army tape relay system at designated Army area signal centers only. (Although Army area signal battalions have the equipment and operating personnel to provide major relay stations, only those stations designated are assigned this function.) The number, location and distribution of these major relay stations will depend on the requirements of the system. As a minimum, however, at least one major relay station should be established in each corps area and two in the field Army service area. Each of these relay stations has a terminal station associated with it whose principal functions are discussed in paragraph 3-42. Designated major relay stations may be *electrically* interconnected; however, tape relay circuits are *normally* patched through intermediate area signal centers. These intermediate area signal centers will function as tributary stations, serving those units in the vicinity.

b. Tape relay stations located in the command signal centers of major headquarters throughout the field army area qualify as major relay stations as defined in paragraph 3-41. However, they may be designated as minor relay stations by the C-E staff officer. This is done in order to avoid overloading command headquarters relay stations with traffic not specifically intended for the headquarters or for the units in the area serviced by the headquarters. Designating these stations as minor relay stations will divert traffic to the major relay stations in the area signal center.

c. Command signal centers at Army main, Army alternate, and FASCOM headquarters have been provided with teletypewriter equipment to establish tape relay and terminal stations. These relay stations may be designated as a minor relay station (*b* above). Teletypewriter equipment to operate a tributary station is provided for army rear.

d. Command signal centers at corps main and alternate operate tributary stations in the tape relay system. In unusual or emergency situations, the C-E staff officer may designate one of the corps stations as a minor relay station for the purpose of providing tape relay circuits to divi-



FM 11-125-3-11

Figure 3-11. Type field army tape relay system.

sion through the corps command communications system.

e. The division support command signal center operates a tributary station in the tape relay system. Connection to the field army tape relay system is made through the nearest major tape relay station established at an army area signal center.

3-44. Equipment Employment

The tape relay system at field army level utilizes teletypewriter equipment as follows:

a. Army area signal centers designated as major relay stations will employ the teletypewriter operations central (AN/MGC-19) as the tape relay station and the telegraph terminal (AN/TSC-58) as the terminal station. Normally, the circuit requirements of a major relay station exceed the capabilities of the AN/MGC-19 assigned to the signal center. One solution is to supplement the AN/MGC-19 with another AN/MGC-19 taken from an area signal center which has not been designated as a major relay. The signal centers which have not been designated major relay stations may still provide a minor relay station in the tape relay system through use of the AN/TSC-58.

b. Army area signal centers which function as tributary stations utilize the telegraph terminal AN/TSC-58.

c. The minor relay and terminal stations at Army main, Army alternate, and FASCOM headquarters use the teletypewriter operations central AN/MGC-22 and AN/MGC-23.

d. The tributary station at army rear utilizes

the AN/TSC-58 teletypewriter terminal provided by the army rear signal operations platoon, headquarters and headquarters company, army command operations battalion.

e. For equipment employed at the echelons of corps and divisions, refer to FM 11-92 and FM 11-50, respectively.

3-45. Routing Indicators

a. Routing indicators serve two important functions. They identify a specific station in the tape relay network and, in the case of minor relays, terminals, and tributaries, define the normal path the tape traffic will take to reach its destination. Routing indicators consist of four or more letters: The first indicates strategic/worldwide use (letter R or Q) or tactical/theater use (letter U); the second and third letters define, respectively, the nation and geographical area involved; the fourth letter identifies major relays, while fifth and subsequent letters identify minor relays and tributary stations. Terminal stations are identified by the suffix letter C placed after the routing indicator of the relay station they serve. When a message is refiled into another means (manual teletypewriter, radio, etc.), the routing indicator must be removed and appropriate call signs used instead.

b. Because routing indicators are derived from the indicator of each major relay station, it will be necessary to change indicators (and the routing indicator publication) when a unit moves out of the area served by a specific major relay station.

c. Routing indicators are derived as indicated in ACP-121D.

Section VII. FIELD ARMY SUPPORT COMMAND COMMUNICATIONS

★3-46. General

a. A Field Army Support Command (FASCOM) is made up of headquarters and various subordinate units and organizations. Each element, including the headquarters, is organized according to a table of organization and equipment. The number and kinds of subordinate organizations (FM 54-3), therefore, can be varied to suit the particular situation. The complete field army support command (fig. 3-12) is designed to support a field army which includes

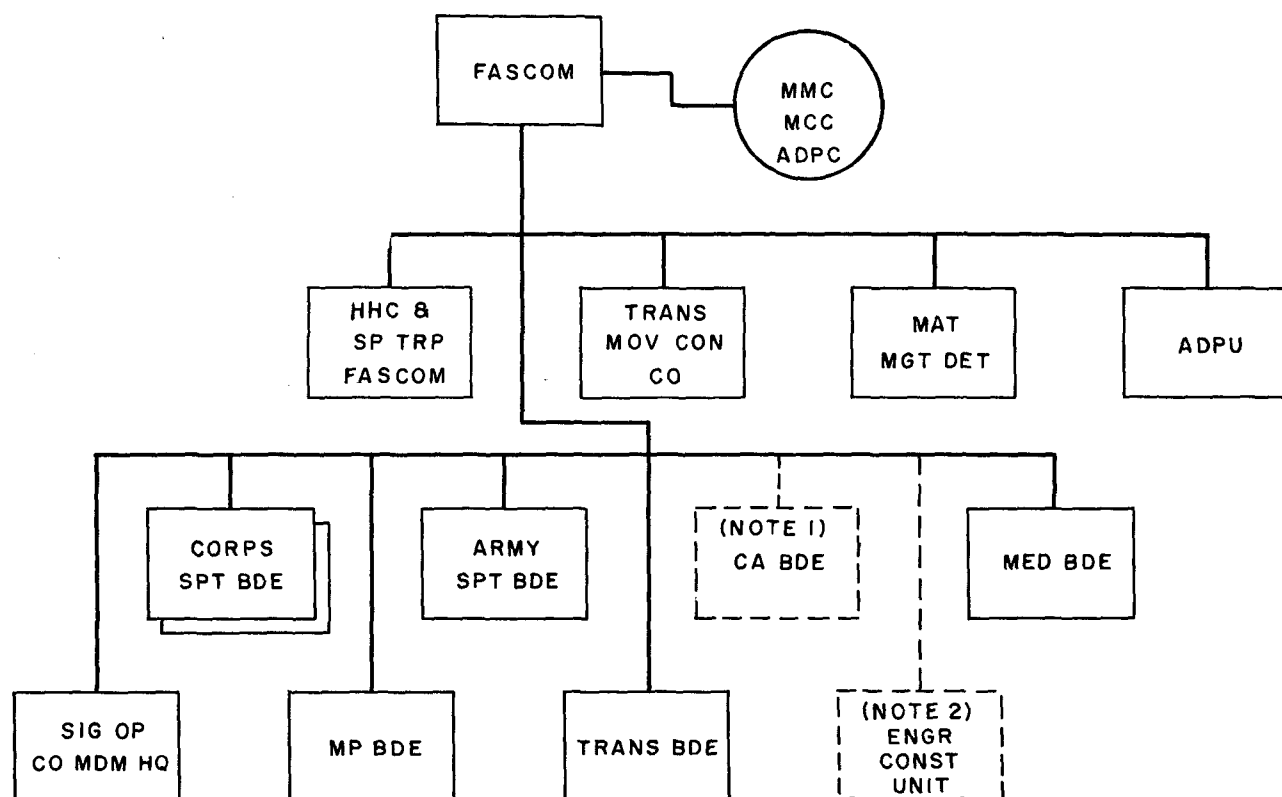
three corps of four divisions each. For smaller forces, the support structure is modified to provide only the capabilities needed. The field army support command provides all combat service support to the field army (or other supported force) except replacements. Communications-electronics and engineer supply and maintenance are included in FASCOM responsibilities. Responsibility for communications-electronics and engineer combat support, however, is retained by the field army commander. The commanding gen-

eral of FASCOM is a major subordinate commander to the CG of the field army and is on the same level as the corps commander. He is charged with providing combat service support to all elements of the field army to support tactical operations directed by the field army commander. In performing his mission, the FASCOM commander relieves the field army commander and his staff from detailed planning and operational responsibilities in combat service support and in the security of the field army area.

b. Communications for the field army support command are provided by the Army area communications system together with signal units

which support the FASCOM headquarters and the inventory control center. In addition, some elements of the field army support command have some organic communications and personnel.

c. The commanding general of FASCOM has responsibilities related to communications operations within the command, in addition to the support provided by the field army area communications system. The FASCOM commander is also responsible for coordination with the commanding general of the army signal brigade in matters related to the overall support provided to his command by the brigade.



NOTES:

1. WHEN NOT ATTACHED TO FIELD ARMY HEADQUARTERS.
2. ATTACHED WHEN REQUIRED.

FM 11-125-3-12

Figure 3-12. A type field army support command organization.

3-47. FASCOM Signal Elements

a. A signal operations company, medium headquarters (TOE 11-127) is provided to install, operate, and maintain the internal communications system and provide photographic support for the field army support command headquarters. When attached to FASCOM, the company depends on the field army signal brigade for trunks connecting FASCOM headquarters with the army area communication system. The signal operations company, medium headquarters is not equipped with multichannel radio or carrier equipment; therefore, the area signal company operating the nearest army area signal center must furnish the extension facilities required to connect the supported headquarters with the signal center. On the initial move into the field area, the commander of the signal operations company, medium headquarters, will coordinate communications requirements with the COMMEL staff officer. Subsequent moves will be coordinated with the commanding officer of the area signal center responsible for providing the necessary communications support. The signal operations company, medium headquarters has the additional responsibility for providing the necessary communications for the associate materiel management center (MMC). Since the company does not have the inherent capability to provide the required communications service for an alternate headquarters or an alternate ICC if such are re-

quired, augmentations with appropriate TOE 11-500 teams will be necessary. The main and alternate echelon (if required) of FASCOM headquarters are connected by multichannel communications to the main and alternate echelons of field army headquarters by the signal battalions responsible for the installation of the army command communications system.

b. A signal small headquarters operations company (TOE 11-147) is attached to each of the corps support brigades and to the army support brigade. The primary mission of the signal small headquarters company is to provide signal communications facilities and photographic services (except aerial combat surveillance) for the support brigade headquarters listed above.

c. Refer to Part Two of this manual for a detailed description of the organization, capabilities, and limitations of the signal operations company, medium headquarters (TOE 11-127) and the signal small headquarters operations company (TOE 11-147).

d. FASCOM headquarters is also connected to TASCOM headquarters by multichannel communications installed, operated, and maintained by signal units assigned to the United States Strategic Communications Command. Refer to FM 11-23 and FM 24-1 for information concerning this communication link.

CHAPTER 4

COMMUNICATIONS-ELECTRONICS STAFF OFFICER AND ARMY C-E SECTION (STANAG 2043)

Section I. COMMUNICATIONS-ELECTRONICS STAFF OFFICER

4-1. General

The field army commander, in addition to his other duties, is responsible for the communications and electronics activities of his entire command. The communications-electronics staff officer serves on the special staff and assists and advises the commander on communications-electronics matters. Refer to FM 101-5 for detailed information on the organization, functions, and responsibilities of the command and staff.

★4-2. Communications-Electronics Staff Officer

The field army communications-electronics staff officer has staff responsibility for the installation, operation, and maintenance of the field army communications systems. The C-E section of headquarters and headquarters company, TOE 51-1, assists the C-E Staff officer in accomplishing his mission. Basically, the C-E Staff officer—

a. Advises on communications-electronics matters, including signal communications, location of headquarters, location of signal facilities, and use of signal activities for deception.

b. Determines requirements for signal communications support and the employment of signal troops. Responsibility at field army and division headquarters does not include plans and recommendations pertaining to supply and maintenance troops.

c. Prepares the signal and electronic counter-countermeasures (ECCM) portion of the training program and exercises staff supervision over signal and ECCM portion of the training program and exercises staff supervision over signal and ECCM training throughout the command.

d. Exercises technical supervision over signal activities throughout the command.

e. Coordinates frequency allocation, frequency assignment and use, and the reporting and processing of interference problems.

f. Assists in preparation of electronic warfare (EW) plans and annexes.

g. Coordinates with the G3 and G2 concerning the communications-electronics (C-E) aspects of tactical cover and deception operations.

h. Plans and supervises the following operations:

(1) Installation, operation, and maintenance of signal communications systems by assigned or attached units.

(2) Still and motion-picture photographic services, except air photography and the operation of film libraries and film equipment exchanges.

i. Takes the following action on matters pertaining to electromagnetic radiation (EMR),

(1) Advises the commander and staff on matters pertaining to electromagnetic radiation environments in the command.

(2) Observes radio frequency emitting equipment of the command and advises on the effective use of this equipment to reduce radio frequency interference with other communications equipment and with nuclear and conventional weapons systems.

(3) Advises the commander of expected effects on the command of all source-produced radio frequencies.

(4) Coordinates measures to reduce electromagnetic radiation interference with the G2, G3,

G5, field artillery, ADA, army aviation, USASA, lower and adjacent headquarters, and supporting services.

(5) Monitors and coordinates C-E aspects of command and control, electronic warfare, communications security including allocation, distribution, and use of COMSEC devices and materials, data communications, missile and other weapon systems, meteorology, satellites, aviation, combat surveillance and target acquisition throughout the command.

j. Implements the signal security policy and procedures.

k. Receives technical instructions, advice, and assistance from the theater C-E staff officer or army group C-E officer, if an army group is formed.

l. Coordinates plans and operations with the C-E staff officer of superior headquarters, and provides technical advice and assistance where needed.

m. Reviews all Modified Tables of Organization & Equipment (MTOE) and Modified Tables of Distribution and Allowances (MTDA) actions

to assure appropriate authorizations for C-E and audio-visual equipment and personnel in line with the command's mission.

n. Provides representation on campaign planning groups to assure proper consideration of C-E support.

★4-3. Assistant Communications-Electronics Staff Officer

The assistant C-E Staff officer performs duties as directed by the army C-E Staff officer. He may act for the C-E officer in his absence and represent him at conferences, inspections, or ceremonies. He normally supervises the signal section to include referring matters to appropriate elements of the section for necessary action. He reviews completed staff work for adherence to policy and form, and refers matters of policy or interest to the C-E officer. He is the contact point for visitors or liaison officer, and coordinates the work of the signal section with that of other staff sections of the army headquarters; with the staffs of higher, lower, and adjacent units; and with the staff of the army signal brigade.

★Section II. ARMY C-E SECTION

★4-4. General

The Field Army C-E Section is organized as part of TOE 51-1, Headquarters and Headquarters Company, Army. The section is used by field army C-E officer in the coordination, planning and technical supervision of the field army communications systems. The C-E staff officer may organize the section as he deems necessary in order to accomplish his mission. The actual organization will depend upon the amount of emphasis he places on each specific function, the personalities and capabilities of the personnel, the existing operating conditions, and the principles of staff organization.

4-5. Mission

The mission of the army signal section is to provide the following:

- a.* Personnel to assist the C-E Staff officer.
- b.* Personnel to assist in the direction and supervision of current field army signal combat support operations.
- c.* Technical assistance in the establishment of

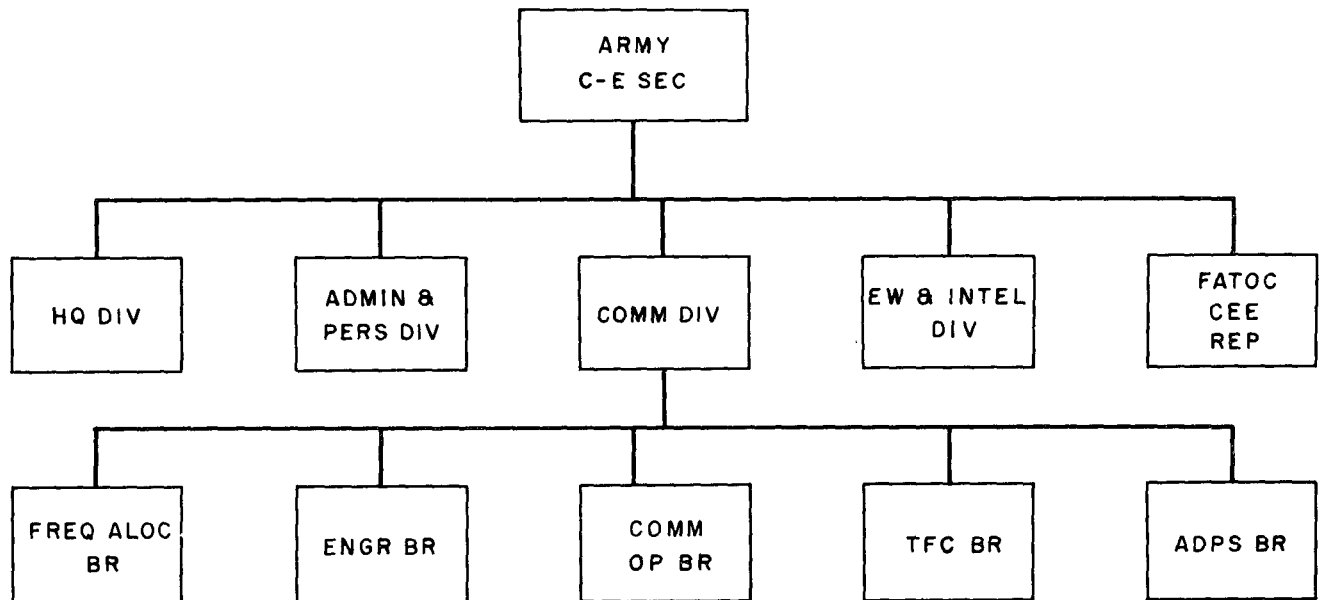
requirements for signal support capabilities, signal technical intelligence, priority allocation, coordination and supervision of signal activities throughout the command.

d. Assistance in all communications-electronics matters, including location of headquarters, location of command and area signal centers, employment of electronic warfare, and the use of signal activities for purposes of deception.

e. Personnel to man the communications-electronics element of the field army tactical operations center (FATOC) and perform the necessary administrative stenographic and clerical duties for the army C-E section.

★4-6. Functions and Organization

The organization of the army communications-electronics section (TOE 51-1) provides personnel to perform the various functions assigned to the activities shown in figure 4-1. Photographic support is provided by the pictorial section of headquarters company of the army signal brigade as described in chapter 9.



FM 11-125-4-1.1

Figure 4-1. Type C-E section organization.

★4-7. Type C-E Section Organization

For operational purposes, the various elements of the section may be organized as shown in figure 4-1, as follows:

a. A headquarters division which may be formed expressly or by implication. The headquarters division directs the activities of the C-E section.

b. The administrative and personnel division is charged with the overall administration of the section. It is responsible for maintaining correspondence files, training of clerks, typists, and stenographers; and for handling all C-E matters, as the C-E Staff officer may direct, pertaining to C-E matters.

c. The electronic warfare and intelligence division supervises the communications and electronics technical intelligence teams and the collection and evaluation of C-E intelligence matters.

d. The communications division is supervised by the C-E Staff officer who is responsible for its operations. This division advises the C-E officer on communications matters and makes plans and recommendations for establishing communications within the field army and its subordinate units. It directs the installation, operation, and

maintenance of the communications systems at field army headquarters; between field army headquarters, such as corps or the headquarters of a service unit; between the army headquarters and the FASCOM headquarters when so directed; and for the army portion of communications systems designated for joint Army and Air Force use. This division coordinates with G2 on the following:

(1) Activities pertaining to C-E technical intelligence.

(2) Planning, coordination, and supervision of communications security within units of the command.

(3) Employment of electronic warfare and combat surveillance devices with respect to their impact on and relationship with, the communications system. Coordination should also include the G3 and Army Security Agency staff officers.

(4) Coordinates with the army G3 on:

(a) Communications-electronics aspects as they pertain to the command's mission and operations.

(b) Effectiveness of the signal organizations and equipment assigned or attached to the organization.

(c) Plans for communications facilities that will support the command's operation in the

event of chemical, biological, and radiological (CBR) attack or operation.

(d) Plans for selection and location of future command posts (CP's) and headquarters.

(e) Plans for physical security of communications installations.

(f) Preparation of orders and instructions pertaining to C-E matters.

(g) Priorities for such C-E equipment and supplies as are in critical status.

e. The communications division is organized as follows (fig. 4-1):

(1) *Engineering branch.* The engineering branch is responsible for the overall supervision of the planning and installation of all types of communications systems used by the field army. It prepares studies of local civilian communications systems to determine to what extent they may be utilized, and gives technical assistance to staff officers and advice to subordinate units of the field army. Technical assistance is also coordinated with the army G5 whenever the civilian populace is involved.

(2) *Frequency allocation branch.* This branch controls and issues radio frequencies and call signs and prepares C-E operations instructions for this purpose. It supervises the location and operation of civil and special radio communications facilities (civil, Armed Forces Radio System (AFRS), press, and psychological warfare). The field army may assign blocks of frequencies directly to corps and divisions.

(3) *Communications operations branch.* This branch prepares plans and drawings, publishes circuit diagrams and line route maps, instructions for very high frequency (VHF) and UHF radio stations at army headquarters and the headquarters of the next lower commands for the use by army troops. It prepares plans and provides test procedures to insure adequate transmission quality of circuits, including radio circuits interconnected to the army wire system.

(4) *Traffic branch.* This branch prepares and publishes telephone and teletypewriter traffic diagrams, and telephone and teletypewriter directories; studies the traffic load on all types of communications systems used by the field army; and recommends the increase or decrease of signal communications facilities. This branch compiles data for future reference on communications installations and provides staff supervision over army communications centers and telephone and teletypewriter switching centers. It also assigns telephone code names and teletypewriter call signs for the army communications system.

f. If a communications-electronics element (CEE) is required for the FATOC, a nucleus of personnel will be provided for this function by the army C-E section. These personnel will advise and assist the field army commander and his staff on all communications-electronics matters as well as keeping the C-E Staff officer advised on all pertinent operational matters affecting signal communications. The CEE is the contact point between the FATOC, the C-E section, and the army signal brigade.

CHAPTER 5

COMMUNICATIONS PLANNING AND REQUIREMENTS (STANAG 2043)

★5-1. General

The primary responsibility of the C-E Staff officer is to plan and provide communications that will permit the army commander to coordinate and control his forces. The C-E Staff officer must:

- a. Insure that the commander and staffs know the capabilities and limitations of the organic signal units.
- b. Maintain an understandable working relationship between the commander and members of the staff.
- c. Consider the inherent and associated communications problems before formulating detailed operations plans.
- d. Insure that communication SOP's are comprehensive, up-to-date, and in continuous use.
- e. Maintain communication equipment in the best possible condition with constant command attention.
- f. Place continuous emphasis on the training of personnel.
- g. Construct plans and alternate plans that are complete, simple, and flexible.
- h. Be knowledgeable and have an understanding of:
 - (1) Communications doctrine as related to the echelons of command and to varying tactical situations.
 - (2) Capabilities of communications personnel.
 - (3) Characteristics, capabilities, and limitations of communications equipments.
 - (4) Performance and necessity of maintenance.
 - (5) Formulation of plans and orders.
 - (6) Operating and procedural functioning.
- i. Have a communications philosophy that encompasses:
 - (1) Planning as complete a system of communications as possible.
 - (2) Employing all available media of communications (never relying solely on any one medium of communications).
 - (3) An appreciation for the varied communications requirements for:
 - (a) Command.
 - (b) Fire support.
 - (c) Intelligence.
 - (d) Air support.
 - (e) Administrative and logistical support.

5-2. Signal Communications Planning Procedures

The planning cycle for the signal planner is continuous and follows the same tested sequence used by the tactical planner as outlined in FM 101-5. A type field army is illustrated in figure 2-1. It may however, be composed of any desired mix of combat, combat support, and combat service support units to accomplish the current as well as subsequent missions. It may also be organized with a small number of divisions without utilizing the corps echelon. Once the general situation of the army has been considered, with special attention given to any unusual situations, such as attachment of allies, freak geographical areas and extremes of climate, steps are taken to determine communications requirements.

★5-3. Estimate of Situation

All planning must be preceded by an estimate of the situation. Operations at field army level are sufficiently large to require a rather formal and detailed estimate. The C-E staff officer prepares an estimate based on the planning guidance issued by the commander and estimates of the staff. The C-E staff officer is assisted by staff

members of the signal section in the preparation of the signal estimate. The C-E staff officer maintains close liaison with the signal brigade commander and his staff in all phases of signal planning affecting the command. The signal estimate may be presented in detail at briefing sessions for the commander or chief of staff. The signal estimate may greatly influence the commander's estimate and his subsequent decision. It must be accurate, sound, complete, and flexible. Detailed guidance for the format and preparation of the estimate is contained in FM 24-16 and FM 101-5. Communications requirements are determined through the process of making the estimate of the situation. The distinction between an estimate and a plan usually will disappear in the final stages of preparation. Communications requirements are developed in the light of certain basic considerations. These considerations are mission, enemy capabilities, troops, area of operations, and logistics:

a. Mission. The signal mission can be determined only by a thorough analysis of the mission of the entire command. This requires a complete study of the mission as stated in the plan of the commander. This study also includes stated objectives and desires of the commander and his staff. Completion of the study will reveal the special communications requirements of the situation, such as rapidity of movement, time phasing of operations, employment of major forces, need and size of reserves, static or slow-moving elements, and location and relocation of command posts.

★*b. Enemy.* The planner considers the capability of the enemy to interfere with or disrupt communications. He must consider the vulnerability of communications to intercept, of communications sites to attack, and of radio communications to electronic warfare. In this respect, he must consider the requirements for communications and physical security, ECCM planning, ECM reporting, and alternate means of communications.

(1) *Troops.* Troops are assigned to an army as dictated by the mission and the ability of the logistics system to maintain them. Sheer numbers will have an effect on requirements for communications and logistics since many features of signal support are of an individual user nature.

(2) *Types of units to be employed.* New weapons, weapon delivery systems, and concepts are constantly being integrated into the

army. Many of these require new units or modifications of existing units. Balances between armor, infantry, and airborne troops will vary from one situation to another. Finally, support organizations and their activities are determined largely by the mission of the army's combat elements. Some types are large users of systems that must be tied into the area system. Those elements that have no organic means must be provided with service. The character of the individual missions will determine their need for signal support and thus will be of primary concern to the C-E Staff officer.

(3) *Number of units.* Every unit represents an increment of service to some significant degree. The mere fact that it is a unit requiring even a minute bit of service makes it an item for planning. It is these individual increments of communications requirements that, finally totalled into large increments, result in the overall requirements.

(a) *Location of units.* Disposition of combat elements and concentrations of support activities and their relative separation become a major consideration. The physical configuration of the communication system will be largely determined by unit locations. In addition, these locations will affect the magnitude of the supply and maintenance task.

(b) *Equipment available.* Planning for the communication system will be significantly influenced by the equipment available on the tables of equipment of the various units. At times, it may be necessary to exceed the table of equipment allowances. If it becomes necessary to procure more equipment, items similar to those already authorized should be used. The use of special types of equipment which is different from that normally used and authorized increases the burden of training, planning, and logistics.

(c) *Requirements of other services.* Since no field army is likely to undertake any mission alone, it is essential that the fullest possible liaison and coordination be maintained with the Navy and Air Force. Navy requirements are likely to be heaviest in island or peninsula warfare, while Air Force support accompanies the army in all of its operations. These services have their own communications facilities, but to effectively support the army, their systems must be connected into the army system at appropriate points. Consideration must be made of incompatibilities which might exist between equipment of army and other services.

(4) *Area.* The characteristics of the area of operations has a great influence on communications planning. These characteristics include weather, terrain, size, and shape of the area of operations and existing communications facilities. A study must be made of the present area and also of all possible subsequent areas. All terrain features that affect the installation and operation of communications must be considered. Plans must be made to overcome possible terrain disadvantages by means of alternate routing or by reconfiguration of radio and multichannel communications equipments.

(5) *Logistics.* All elements of logistics that affect communications are considered. These elements are supply, maintenance, and transportation. The location and composition of logistical complexes, rear boundary location and its movement, and higher headquarters support are also considered.

5-4. Coordination

The chief of staff is the principal coordinating agent of and advisor to the commanding general. In this capacity, he determines the phases and scheduling of planning, designates the planning responsibilities of the general and special staff sections, and coordinates the planning process. Much information regarding the mission will come from him. In addition to the chief of staff, the signal officer must confer with many other staff sections, agencies, and activities, to obtain the information and data that he needs to formulate the signal support requirements of the army. In all planning and operations, the COMMEL staff officer must consider his relationships with the following:

a. Assistant Chief of Staff, G2, Intelligence. Control of army security agency units resides with G2, but the communications aspects of their mission must be planned and coordinated with the signal officer. Other intelligence units and activities will generate communication require-

ments, many of them of a special nature. In addition, the G2 will be interested in the control and allocation of any critical items of signal supply.

b. Assistant Chief of Staff, G4, Logistics. Location of depots, support complexes, pipelines, port facilities, etc., are all in the province of G4. He can supply information of a general overall nature, while any required details will be provided by the FASCOM commander or members of his staff. Adequacy of the signal plan to support the army's logistical plan should be coordinated with G4.

c. Other Staff Relationships. The army COMMEL staff officer consults, and coordinates with other staff officers of the army coordinating and special staffs. A partial list of items that are coordinated with the various staff officers is as follows:

- (1) Actions affecting communications-electronics personnel, G1.
- (2) Communication security and intelligence: G2.
- (3) Plans, operations, and orders: G3.
- (4) Logistics: G4.
- (5) Railway, highway, waterway, and port communications requirements: G4.
- (6) Photographic requirements: A11.
- (7) Electronic warfare: USASA, G2, G3, artillery, army aviation, and air defense.
- (8) Support by indigenous facilities: G5.

d. Higher Commands. The field COMMEL staff officer will receive technical instructions, advice, and assistance from the theater army signal officer, or army group COMMEL staff officer if an army group is formed.

e. Subordinate Commands. The field army COMMEL staff officer exercises technical supervision over the signal logistics, communications-electronics, and photographic activities of subordinate commands.

CHAPTER 6

★SECURITY, ELECTRONIC WARFARE AND TRAINING (STANAG 2079)

Section I. PHYSICAL SECURITY

6-1. General

Physical security includes those measures taken to protect the unit against the following:

- a. Attack by enemy ground, air, and airborne elements.
- b. Chemical and biological warfare attack.
- c. Nuclear burst and the resultant radiological activity.
- d. Enemy guerrilla activity.
- e. Enemy observation.

6-2. Mission Diversion

The missions of signal units require them to furnish communications support on a 24-hour basis. Under certain conditions, the dispersion of units may require that considerable amounts of the communications support efforts of the units be diverted from communications to provide necessary physical security for their installations. To insure the maximum productive use of the units' communications capability, security for the unit installations within the areas of the various supported headquarters must be assumed by the troops that provide the security forces for these headquarters.

6-3. Installation Security

Physical security for communications facilities is required to insure that these facilities may operate undisturbed by local enemy action. This security may be provided by the headquarters that is supported by the communications facilities, or it may be provided by the element of the signal unit that is responsible for the communications facilities. A summary of installation security information is presented in *a* through *c* below.

a. Perimeter Defenses. The perimeter defenses of the supported headquarters provide the physical security required by signal elements that may be located within that perimeter.

b. Site Defenses. Many communications sites are installed outside the defense perimeters of the supported headquarters. Depending on local conditions, physical security for these installations may be provided by the signal element, but usually must be provided by the supported headquarters. Refer to FM 7-15 and FM 21-75 for detailed information on individual and small defense actions.

c. Stability Operations Security. During stability operations (para 6-9 through 6-11) it may be necessary for signal elements to be established in hostile, nongovernment controlled areas. If the parent organization cannot provide both the necessary physical security and adequate communications support for these sites, requests are made for support by designated physical security forces. According to the circumstances, either United States or host country forces may provide this support.

d. Rear Area Protection (RAP). Overall area security and control is the responsibility of the senior commander in the area. The field army support (FASCOM) commander is responsible for providing rear area protection for the field army service area. This area is that portion of the field army area between the corps rear boundary and the field army rear boundary. Rear area protection is divided functionally into rear area security and area damage control. The commander exercising area control is responsible for protecting the resources of his area from interruptions caused by enemy activities or natural disaster. He is not responsible, however, for providing local defense, air defense, or defense against major enemy actions which are a threat

to the entire command. Each signal unit commander is responsible that each installation under his control plan, prepare and rehearse not only for its own defense but also for its design-

ated part in the overall rear area security plan. FM 100-10, FM 100-15, FM 101-5, and FM 31-85 provide details and discussions of RAP and organization for RAP requirements.

★Section II. COMMUNICATIONS SECURITY AND ELECTRONIC WARFARE

6-4. General

The mission of many signal units makes them especially lucrative targets for signal intelligence and electronic warfare exploitation. Signal unit must utilize all available communications security (COMSEC) and counter-countermeasures to reduce the impact of such exploitation on unit operations.

★6-5. Communications Security

Communications security is defined as the protection resulting from all measures designed to deny to unauthorized persons information of value which might be derived from the possession and study of telecommunications, or to mislead unauthorized persons in their interpretations of the results of such a study. Communications security includes cryptosecurity, physical security, and transmission security.

a. Cryptosecurity is that component of communications security which results from the provision of technically sound cryptosystems and their proper use.

b. Physical security, as included here, is that part of communications security concerned with physical measures designed to prevent unauthorized access to equipment, facilities, material, and documents. Refer to AR 380-5 and AR 380-40 for detailed information.

c. Transmission security is that component of communications security which results from all measures designed to protect transmissions from unauthorized interception, traffic analysis, and imitative deception.

★6-6. Application of Communications Security

The basic objective of communications security (COMSEC) is to prevent unauthorized personnel from gaining useful information from communications. This objective can only be realized if all personnel are security conscious and are aware of their personal responsibilities in this

regard. COMSEC should be a habit—a state of mind developed through training and application in daily routine. All personnel should be thoroughly familiar with and follow the security practices designed to minimize the value of communications as a source of intelligence to unauthorized personnel. A summary of the more basic practices for effective COMSEC follows. (Refer to FM 32-5 for a more detailed discussion.)

a. Cryptosecurity.

- (1) Use only authorized cryptosystems.
- (2) Insure strict compliance with the operating instructions.
- (3) Use cryptosystems designed to provide the degree and type of security required.

b. Physical Security.

- (1) Maintain proper safeguards against capture, theft, or unauthorized observation of messages and COMSEC materials at all times.
- (2) Maintain adequate emergency evacuation and destruction plans and rehearse them frequently.
- (3) Guard against carelessness and laxity by conducting frequent inspections and tests of security measures.

c. Transmission Security.

- (1) Use radio transmission only when other means of communications are not adequate.
- (2) Be aware that all means of transmission, not only radio, are subject to interception by unauthorized personnel. Restrict unclassified plain language transmission to a minimum.
- (3) Maintain circuit discipline and avoid extraneous transmissions.
- (4) Assign call signs/words and frequencies in a random manner and change them simultaneously at frequent intervals.
- (5) Make transmissions brief.
- (6) Use broadcast and intercept transmission methods when possible.

(7) Use only prescribed communications operation procedures.

(8) Use authentication properly.

(9) Use minimum power required.

★(10) Insure that each message is assigned the proper precedence, depending solely on the urgency of getting the message to the addressee.

★Section II.1. ELECTROMAGNETIC INTERFERENCE

★6-8. Electronic Warfare

It is often extremely difficult to determine whether electromagnetic interference (EMI) is intentional or unintentional because effects on C-E material are almost identical. (Figure 6-1 shows scope of EMI and furnishes a quick reference to pertinent publications.) Intentional EMI is conducted and countered as part of electronic warfare. Unintentional EMI is minimized by good electromagnetic compatibility. The modern field army depends increasingly on signal communication to provide command control to meet tactical requirements for maneuverability and essential operational flexibility. Accordingly, signal communications systems provide the essential element for command control. Therefore, signal units must take all possible action to insure effective use of their own communication systems. The communication security practices discussed in section II are vital to the protection of information which might be derived from the possession and study of communications. However, as communications security becomes more effective, the probability increases that an enemy will seek to degrade or deny use of friendly communication systems through the conduct of electronic warfare operations. At the same time, the conduct of war must include actions to degrade or deny the enemy's effective use of his communications systems.

★6-8.1. Vulnerability to Hostile Signal Intelligence and Electronic Countermeasures

With the exception of physically secured wire circuits, all communications transmissions, regardless of frequency, are subject to intercept, traffic and cryptographic analysis and direction finding which may subsequently lead to hostile jamming or deception activities. Line-of-sight distances characteristic of VHF (30 to 300 Mhz) transmissions are often exceeded as a result of abnormal and unpredictable ionospheric and

★6-7. Communications Security Assistance

COMSEC assistance for facilities used by signal units may be provided, as appropriate, by tactical support elements of the US Army Security Agency (USASA) group of a field army or by USASA (theater) headquarters, in accordance with AR 10-122.

meteorological conditions; therefore, interception can occur far beyond the horizon when proper skip conditions exist. Radiation paths in the ultra high frequency spectrum (UHF, 300 to 3000 Mhz) are essentially line-of-sight. The transmitted energy in the UHF spectrum range does not travel from the emitter antenna to the receiver antenna in the form of a pencil beam, but in the form of a cone, its base growing increasingly broader as the distance from the emitter increases. Thus, for the microwave link mounted on two widely separated mountain tops, interception of the transmitted energy can occur at locations miles from the intended receiver. Furthermore, the microwave link can be effectively jammed with a jamming transmitter when placed side by side with the intercept equipment. Communications systems are therefore vulnerable to communications intelligence (COMINT) activities and electronic countermeasures (ECM).

a. Hostile Signal Intelligence Activities. Effective jamming and deception activities depend upon adequate information concerning enemy communication systems, such as their capability, use, deployment, operational readiness, and their vulnerability to COMINT, and ECM. Conversely, the denial of such information about our communication systems hinders the enemy in developing effective ECM techniques. Through the use of monitoring equipment, it is possible to intercept and analyze radiated electromagnetic energy to determine transmission frequency, power output, type of modulation, and other technical data. From an analysis of this data base, together with direction finding procedures, a reasonable determination can be made of the type and probable use of the system, number of stations in a radio net, and location of individual stations. The SIGINT information thus derived is used to plan and conduct ECM operations.

b. Electronic Countermeasures. ECM involve various forms of deliberate interference with

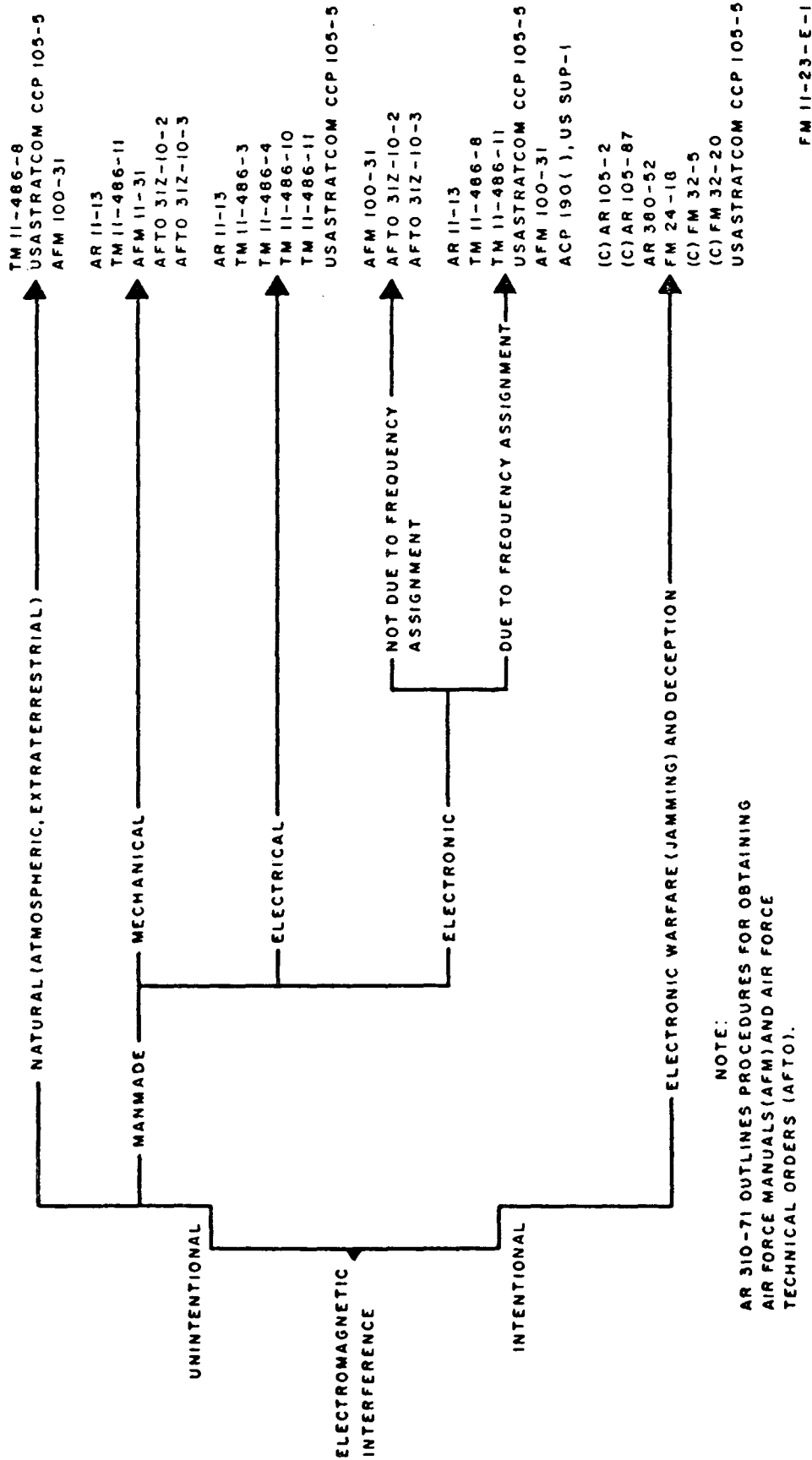


Figure 6-1. Scope of electromagnetic interference.

electromagnetic emissions. ECM must be carefully planned, executed and supervised, lest it be haphazardous or disruptive to our own communications. To be effective, ECM must deny the enemy the effective use of his electromagnetic emitters.

(1) There are two basic types of radio jamming: spot and barrage. Each basic type may be modulated by noise or other interference signals. The various interference signals are discussed in FM 24-18 and 24-21. The decision as to which type of jamming signal to use depends upon the situation, and the characteristics of the intended victim's equipment. General advantages and disadvantages of each type of jamming are discussed in FM 32-20. It should be noted that tactical communications equipment (that is, radio transmitters) can be used in a spot jamming role.

(2) Communications deception is an attempt to deceive, confuse, or mislead radio operators and intelligence channels. Deception can be divided into two major types: imitative and manipulative. A subdivision of manipulative deception consists of simulative techniques. Deception, to be successful, must appear to be natural and is dependent upon the enemy's reaction to the deception techniques. Communications deception is normally a part of a well-planned tactical cover and deception operation. FM 31-40 discusses the incorporation of manipulative deception in tactical cover and deception operations. A general discussion of deception types follows (Refer to FM 32-20 for a more detailed discussion).

(a) Imitative deception is the intrusion into an enemy communications system with electromagnetic radiations that are imitations of his own. Deception operators should be well trained in imitating the idioms, expressions, and speech mannerisms of those they are attempting to deceive. A low-level noise jamming background combined with the deceptive message may aid in disguising accents or other speech differences.

(b) Manipulative deception is the deliberate transmission of false or misleading information over one's own communications system in an attempt to deceive or mislead a listening enemy. The manipulation of message traffic loads is a deception method. Another method may involve planting a false message on our own communications system in the hope of misleading the enemy. Simulative deception is a type of mani-

pulative deception involving the creation of radiations which simulate one's own units, installations, or activities to confuse or deceive an enemy as to the location, strength, movement, or intent of one's own forces. For example, dummy radio nets may be maintained after the actual units have departed from the area. Simulative and other forms of manipulative deception are conducted with organic tactical communications systems with advice and support rendered by USASA.

★6-8.2. Defense Against Electronic Warfare

The successful application of ECM by the enemy requires technical and operational characteristics of target communication systems. Since this information is obtained through communications intelligence operations, the first step in defending against ECM is to prevent or minimize enemy opportunities to conduct these operations. The communications security practices discussed in section II and in FM 32-5 will be effective in defending communications intelligence (COMINT) activities. However, an enemy can be expected to employ ECM whenever he considers it advantageous, in spite of our enforcement of sound communication security procedures. Consequently, preliminary planning must consider protective aspects against COMINT and ECM.

a. Factors to be Considered. Planning protective measures against COMINT and ECM is a coordinated effort of the G2, G3, EW/cryptologic staff officer, and the communications-electronics staff officer. To evade enemy ECM or reduce its effects, it is necessary to:

(1) Consider the disposition of known or suspected enemy electronic warfare units which could hinder the success of the mission.

(2) Maintain and update the estimate of enemy communications intelligence (COMINT), and ECM capabilities.

(3) Establish communication nets so that the strongest possible signals will be received at all stations, keeping distances between stations as short as possible.

(4) Provide alternate routing and alternate channels for radio communication and alternate means of communication in the event radio cannot be used.

(5) Arrange nets so that satellite stations can communicate with each other as well as with the net control station.

(6) Insure that radio equipment is properly maintained and aligned.

(7) Provide for the interception, location, and destruction or neutralization of jammers.

(8) Determine how the mission will be affected if enemy ECM forces stop critical radio communications.

(9) Provide for the maximum use of communication means other than radio whenever possible.

(10) Schedule periods of radio and/or listening silence when radio is not the sole means of communication and when silent periods will not be detrimental to success of the tactical mission.

(11) Include in the unit CESI/CEOI:

(a) Authenticators for messages, radio stations, and telephone.

(b) Random assignment of radio frequencies and a frequency change.

(c) Random assignment of call signs and a call sign change.

(d) Frequencies and call signs for maintenance purposes.

(e) Instructions for the reporting of accidental interference, jamming, and deception.

(f) Instruction for actions to be taken in the event of jamming or deception, (MISI Report).

(12) Train radio operators to apply ECCM techniques and copy messages through jamming.

b. Electronic Counter-Countermeasures. The radio is directly responsible for continued communications and, therefore, for the ECCM techniques that contribute to continued operation. A skilled operator can copy messages through all but the most severe cases of jamming. The radio operator must be capable of distinguishing between atmospheric or accidental interference and jamming. He must be able to recognize various jamming types and signals and must know which techniques are appropriate as counter-countermeasures. These skills and knowledges, as well as procedures for reporting ECM, are detailed in FM 24-18 and FM 24-21.

★6-8.3. Electronic Warfare Planning Responsibilities

Planning guidance for electronic warfare (EW) activities is contained in FM 32-30 and FM 101-5. Planning includes consideration of the friendly use of COMINT, jamming, and deception, as well as defensive actions against enemy

COMINT and ECM activities. The G3 has primary responsibility for the conduct of EW operations. He exercises staff supervision over United States Army Security Agency (USASA) resources and coordinates EW support of tactical operations. The G3 is assisted by the following staff members and agencies:

a. ACofS, G2, Intelligence. The G2 considers the intelligence aspects of EW. In coordination with the EW/cryptologic officer, requirements for COMINT support to ECM operations are determined and planned. Potential advantages accruing from friendly jamming and deception operations must be weighed against the possible loss of information vital to the communications intelligence effort. The G2 recommends signal security policy.

b. Communications and Electronic Staff Officer. This staff officer assists in the preparation of EW plans and orders, particularly the ECCM portion. He advises on matters pertaining to the electromagnetic radiation environment and maintains a list of frequencies used by friendly forces on which jamming activities should be avoided. The communications-electronics staff officer implements signal policy and procedures of the command.

c. EW/Cryptologic Officer. The EW/cryptologic officer prepares and coordinates the EW annex to plans and orders. He advises on SIGINT, SIGSEC, and EW matters and assists in determining requirements for USASA support.

d. Electronic Warfare Element (EWE). The EWE of the Field Army Tactical Operations Center (FATOC) provides:

(1) The current status and capabilities of supporting ECM resources.

(2) Maintains an estimate of the EW situation.

(3) Recommends the employment of ECM resources.

(4) Assists in the preparation of the EW portion of plans and orders.

(5) Provides advice and assistance to the C-E officer on ECCM matters and assists in the evaluation of vulnerabilities of friendly C-E emitters to hostile SIGINT and ECM.

★6-8.4. Conduct of Electronic Warfare

EW is a combat support activity which should be employed in close coordination with fire and

maneuver to achieve increased combat effectiveness.

a. The US Army Security Agency is primarily responsible for the conduct of COMINT, SIGINT, and ECM activities in accordance with AR 10-122.

b. Manipulative deception is normally conducted with organic resources of tactical units and supported by USASA. Signal units may conduct other forms of ECM as authorized. Consequently, units of the army signal brigade, in addition to performing their regular mission may be assigned an ECM role. Conduct of ECM in signal units is planned in coordination with the EW/cryptologic officer, supervised by the communications-electronics staff officer, and executed using organic communication equipment. ECM operations are conducted in accordance with AR 105-87.

c. FM 32-20 contains detailed policy guidance as well as authority and constraints relative to EW employment.

d. Note that all radio equipment and systems discussed in this FM are vulnerable to enemy COMINT and ECM activities. Therefore, all using personnel must be trained in EW and the transmission security procedures discussed in chapter 6.

★6-8.5. Electromagnetic Compatibility

Electromagnetic compatibility (EMC) is a condition, goal, or state; that is, the freedom from the effects of unintentional interference. In any given situation, at any specific time, the level of EMC which exists is a function of three primary factors: environmental geometry, materiel characteristics, and spectrum distribution. The environmental geometry includes identification of all emitters and receptors and involves the spatial relationships (three dimensional) among these emitters and receptors, and the particulars regarding terrain and propagation. Materiel characteristics include all features which influence the degree of correct information transfer achievable under given electromagnetic environmental operating conditions. Spectrum distribution can be described as the specific frequency assignments involved. Control of environmental geometry, materiel characteristics, and the distribution of spectrum resources, all vital to the achievement of minimum required levels of EMC, cannot be accomplished in ignorance. The educa-

tional area is directed primarily toward training of field units concerning EMC impact, alternatives, and techniques applicable to the operation and maintenance of C-E materiel; however, this area also includes education of concept and materiel development personnel in the importance of considering EMC during all stages of the materiel life cycle. In reality, C-E concepts are not always implemented exactly as developed; C-E materiel is not always employed in the manner intended; and availability of spectrum resources always changes to some degree. For these reasons, there is a requirement for a remedial compatibility capability; that is the solution of field EMC problems which exceed the capabilities of the organizations and units in the field. Based upon past experience, it can be anticipated that such problems will be of a critical nature in which quick reaction is of the essence. Fortunately, the same factors are involved, similar control is required, and similar support is needed for both preventive and remedial compatibility. This need for remedial compatibility has been recognized in the Army electromagnetic compatibility program (EMCP) by creating the operational EMCP area to coordinate the full application of Army EMCP resources in solving operational EMC problems. In addition, this program area functions as an interface between the program and the organizations involved in actual C-E operations and provides feedback from the real C-E world to all Army EMCP areas. Responsibility for this Army-wide, worldwide program area—the operational EMCP—has been assigned to the US Army Strategic Communications Command.

★6-8.6. Frequency Spectrum

a. *Composition.* The frequency spectrum comprises all known forms of electromagnetic radiation which include, in order of decreasing wavelength, radio waves, microwaves, infrared radiation, visible light, ultraviolet radiation, X-radiation, and gamma radiation. Radio waves constitute only an extremely small portion of the entire frequency spectrum. Only three ten-millionths of the total known spectrum is occupied by radio waves in a space of approximately 3 million MHz.

b. *Compatibility Between Frequencies and Types of Service.* Since propagation characteristics vary at different parts of the spectrum, not all frequencies are equally useful or desirable for the same type of service. A radio communication

link between the US and Australia must use a frequency suitable for radio propagation at that great distance. Conversely, control tower communications with aircraft in the vicinity of the airfield should use frequencies with a limited range of propagation to prevent interference. The type of service greatly determines the frequencies to be used.

c. Principles of Spectrum Occupancy.

(1) *Extent of occupancy.* Complete spectrum occupancy is a spectrum's use fully, continuously, and uniformly throughout the world. Complete occupancy, however, cannot be a goal since no space would remain for future applicants for frequency assignments. Some frequencies must be reserved for future requirements for new communication links, increased traffic loads on existing circuits, and new types of services.

(2) *Conservation.* The spectrum is similar to other natural resources that must be conserved through strong, administrative control and management. This control and management must be dynamic rather than passive. Demands are constantly changing, some increasing, some decreasing. Spectrum occupancy must be monitored to insure that qualified users are using their assigned frequencies and not simply preempting the spectrum from others. New techniques are reducing the transmission bandwidths so that more stations can operate side by side without interference.

(3) *Frequency sharing.* Within the same service area, two or more stations with light traffic loads can time-share a frequency. Also, the same frequency may be assigned (for simultaneous operation) to a number of radio stations with geographic service areas that do not overlap. With these methods, the same frequency can be assigned to many radio stations throughout the world.

(4) *Review of priorities.* For extremely crowded portions of the spectrum, it is necessary to review the operations presently assigned frequencies to determine which may be canceled to make room for higher priority requirements.

★6-8.7. Radio Interference

a. Noise. In the most general sense, noise may be explained as any energy received other than the wanted signal—for example, acoustical noise is any sound other than that which the listener

wants to hear. The unwanted clutter or snow visible on a radarscope or television picture tube is called noise. Static of an interfering station in a radio communication system is known as noise. For the purpose of this section, noise consists of interfering electromagnetic signals or electrical disturbances.

b. Signal-to-Noise Ratio. As is with other types of noise, when EMI is present, the level of a wanted signal must be raised or the interference reduced so that there is at least an acceptable snr. The minimum acceptable signal-to-noise ratio (snr) is often a subjective value, as in the case of a radio operator attempting to hear a particular signal in the presence of static or interference from other stations; or a radar operator attempting to select a particular target in the presence of heavy ground clutter. Obviously, the snr must be kept at an acceptable value. In general, it is preferable to reduce interference rather than to increase signal strength to achieve a satisfactory snr figure.

c. Natural Interference. Natural interference is due to electrical storms, precipitation, solar or extra-solar system sources. Reduction at the source is beyond the state-of-the-art for natural interference although there are some engineering and operational techniques for reducing the effect of such interference.

d. Manmade Interference. Manmade interference may be broken into three types:

(1) Jamming (intentional interference or electronic warfare).

(2) Interference due to frequency assignment.

(3) Unintentional interference due to causes other than frequency assignment.

★6-8.8. Interference Sources

a. Fundamentals of Interference Generation. The generation of interference is always associated with a varying electric and magnetic field. Variations in currents must be associated with variations in voltage, variations in impedance, or both.

(1) *Varying voltages.* A varying voltage is generated by three major methods: feedback or negative resistance in vacuum tube or transistor circuits; mechanical means in rotating machines; and electrical variations in the characteristics of an impedance.

(2) *Varying impedances.* A variation in the impedance characteristics of an element can cause a varying current and thus represents an interference potential. This variation can be subdivided into two types: nonlinear and linear. Impedances whose magnitudes do not depend upon the currents flowing through them or the voltage impressed across them are linear impedances and all others are nonlinear impedances.

b. Classification of Manmade Sources of EMI. Depending upon origin, the sources of EMI generation can be divided into two groups: non-electronic and electronic.

(1) *Nonelectronic EMI.* A number of sources associated with the operation of Army facilities (such as motor generators, ignition systems, medical equipment, welding shops, etc.) may produce EMI. Many of these may not be under the immediate cognizance of the C-E manager. However, the performance characteristics of these equipments can have an appreciable effect on the overall operation of the area electronics complex. The interference from nonelectronic sources is usually caused by an abrupt change in waveform and results in a signal with energy distributed over a relatively wide frequency range. Some devices have resonant characteristics resulting in a particularly predominant narrow band of frequencies. The effect of this type of interference generally decreases with increasing frequency but can produce significant problems above 300 MHz.

(2) *Electronic EMI.* Radar and certain communications and navigational equipment are intended to emit energy at particular frequencies but may also emit energy at harmonic and spurious frequencies. Other types of electronic equipment potentially capable of generating harmonic and spurious frequencies include RF stabilized arc-welding equipment, induction, and dielectric heating units, and some electromedical devices.

c. Types of Interference Sources. Following is a listing of some of the types of EMI generators which may be encountered:

- (1) Power transmission lines and facilities.
- (2) Electrical lights.
- (3) Electrical motors and generators.
- (4) Electrical controller equipment.
- (5) Gasoline engines.
- (6) Electrical welding equipment.
- (7) Industrial heating and sealing equipment.

- (8) Electromedical equipment.
- (9) Radio and radar transmitters.
- (10) Radio and radar receivers.

d. Transmission of Interference.

(1) *General.* The energy in an interference signal is transferred or coupled in a manner similar to that for desired signals. Two circuits are coupled when the currents or voltages in one produce corresponding currents or voltages in the other. This transfer of energy can take place by free-space radiation, conduction, inductive, or capacitive coupling, or by any combination of these methods.

(2) *Conduction.* EMI conduction is the transfer of unwanted energy along a conductor from an interference source to a susceptible receiver. This requires two conductors between the circuits before a conduction current can flow. A filter might be used to reduce or eliminate this type of interference. In modern C-E equipment, there are three predominant routes for conduction current: power supply leads, control and accessory cables, and grounding systems.

(3) *Radiation.* EMI can be transmitted from a source by radiation and coupled to C-E materiel by conductive and inductive or capacitive modes. The proper design of the basic equipment insures that the equipment case properly shields against radiation and that conduction along outside leads is minimized by filtering or bypassing. Adherence to good engineering and installation practices will help attain electromagnetic compatibility but poor maintenance, faulty repairs, or careless modifications to equipment or buildings can still create an EMI problem. The effectiveness of a shielded room can be destroyed by the improper installation of an air duct or plumbing. A grounding system can be seriously impaired by an excavating crew. The moving of a cable or conductor, or improperly placing another cable adjacent to it, may induce EMI or allow circulating currents. C-E personnel must always consider possible consequences of interference when planning modifications.

e. Reception of Interference. When interference is not suppressed at the source and is transmitted to the vicinity of a receiver, it can effect the operation of the receiver only if it finds a suitable path of entry. A signal can enter a receiver through four basic paths: antenna system, the power and control leads, the output leads, and case penetration.

(1) *Antenna.* Since much interference energy is transmitted by radiation, the antenna is by far the most susceptible input path and it leads to the most sensitive part of the receiver. The sensitivity and directional qualities of the antenna are a function of its effective length or aperture at the interference frequency. These factors can often be used advantageously to increase the effective transmission-path loss. The antenna lead-in also must be considered as a path for interference entry. This consideration is especially important if the lead-in is run close to an interference source with an inductive field.

(2) *Power and control leads.* The power and control leads can provide a path of interference entry to the receiver. The powerlines are a particularly important source of interference because of the possibility of direct connection to many interference sources. Although control lines normally do not have such direct connection, they can be inductively or capacitively coupled to interfering sources. This effect is intensified if the control line is long, if it has a high impedance, or if it carries a low-level signal.

(3) *Output leads.* Output leads also can provide transmission paths for the interference signal. This is not a usual source of interference because of the high-signal level and the low-impedance output common for receivers.

(4) *Case penetration.* In some instances, the attenuation of a signal when passing directly through the equipment case may be far less than that for spurious frequency antenna-conducted signals.

f. Receiver Characteristics Relevant to Interference Reception. A receiver accepts certain forms of electromagnetic energy and rejects others. However, a receiver is not a simple sorter of energy types—for example, if A is a wanted signal and B and C are unwanted signals, the receiver may reject B if only A and B are present; or C if only A and C are present; but may experience serious interference if A, B, and C are present simultaneously. In receivers, major factors relevant to interference include sensitivity, selectivity, and unwanted responses. Many of these factors are treated in considerable detail in numerous publications on radio and radar receivers.

g. Electromagnetic Interference Reduction Techniques. AR 11-13 authorizes and requires C-E personnel to take all possible steps toward

reducing EMI. This paragraph describes general reduction techniques. If the problem is beyond base-level skills and resources or involves equipment modification, assistance will be requested as prescribed in USASTRATCOM Supplement to AR 11-13. Adequate care in initial design and adequate development usually results in equipment sufficiently free of extraneous signal emanations and low susceptibility to unwanted signals. With such equipment, little or no mutual EMI will be experienced. Good installation engineering practices minimize problems caused by equipment installation and operation. This will also minimize or eliminate the need for the consideration and application of suppression techniques at a later time. However, the C-E manager of existing facilities may be required to correct or compensate for equipment deficiencies by using remedial interference techniques.

h. Equipment Interaction. A good basis system installation results in the optimum operation of individual equipment with a minimum of unwanted interaction. Operating convenience may be a reason to position equipment close to each other; however, such close spacing may result in mutual interference between equipment having incompatible signal source and susceptibility characteristics. In some instances, such as equipment engineered as a physical part of an aircraft or weapon system, the C-E manager may have no control over equipment arrangement and relationship to antennas and ancillary units. In other instances (such as in some fixed installations), he may be able to arrange placement which is most consistent with interference-reduction requirements. After equipment has been placed, other means must be employed for required systems suppression. Techniques applicable under these circumstances include: filtering and bypassing unwanted signals, shielding against them electromagnetically, and bonding equipment and transmission lines to ground by some low impedance path.

i. Interference Coupling Modes. During transmission from source to receiver, all efforts toward reducing interference are aimed at improving the ratio between the coupling for the wanted signal and the coupling for the unwanted signal. Some of the ways in which this objective can be achieved are:

(1) *Space and orientation decoupling to unwanted signals.* Increasing the distance between the receiver and the source of unwanted signals

is an obvious means of interference decoupling. If the wanted and unwanted signal sources lie in different directions from the receiving site, then optimum orientation of directional receiving antenna will effectively reduce interference. Increased antenna directivity is usually beneficial, particularly against a plurality of unwanted sources not in the same direction as the wanted source. If wanted and unwanted signals have different polarization, the use of the optimum polarization for the receiving antenna will be helpful. Antenna orientation is determined by system operational requirements, and it may not

always be possible to redirect an antenna, employ sector scanning, etc.

(2) *Frequency decoupling and time sharing.* Transmission systems operating at different frequencies for wanted and unwanted signals achieve interference reduction by the best choice of these frequencies, relative to the receiver selectivity. Time sharing is a technique whereby both wanted and unwanted transmissions may occupy the same channel for separate, nonoverlapping periods of time. Since both approaches to interference reduction are elementary, they are often investigated before other measures.

Section III. STABILITY OPERATIONS

6-9. General

Stability operations is that portion of internal defense and internal development operations provided by the US Army to maintain, restore, or establish a climate of order within which responsible government can function effectively and without which progress cannot be achieved. The field army or other organization to which a signal unit is assigned may operate in these stability operations. When the field army, for instance, is engaged in such operations, each signal unit adapts its SOP to the local situation and performs its regular communications mission for the field army.

6-10. Additional Functions in Stability Operations

In addition to performing its regular mission in support of a field army or other unit, a signal unit, as applicable, may be assigned the following additional functions:

a. Civil Emergency Communications. The unit may have to assist in reestablishing civil emergency communications if communications facilities in the area have been damaged beyond use, or establishing communications if they never existed.

b. Civil Communications Extension. The unit may have to extend existing civil communications facilities if such extensions are required by the civil internal defense effort of the receiving state.

c. Friendly Military Communications. Augmenting the communications capability of friendly forces may be an additional function of a signal unit. This function may be generated by international US commitments with respect to internal defense and internal development operations.

d. Advice and Assistance. Technical advice and assistance in the field of communications may be another additional function. Such advice and assistance with respect to the stability operations of a US force may be in connection with either the training activities or the tactical operations of military forces of the receiving state.

6-11. Capability Reduction

When a signal unit is committed to fulfill the above additional functions to any great extent, it normally will have to divert personnel and equipment from its regular mission. This results in a reduced capability to satisfy army communications requirements. A detailed discussion of the effects of internal defense and internal development operations on signal communications is contained in FM 11-57 and FM 24-1. The following manuals contain detailed information on doctrine and procedures concerned with internal defense and internal development operations: FM 31-16, FM 31-22, FM 31-22A, FM 31-23, FM 33-1, and FM 100-20.

Section IV. DEFENSE AGAINST ENEMY AIRCRAFT

6-12. General

In any combat theater all units must realize the threat of attack by enemy aircraft and must be

prepared to take action against the attack. The attack may be in the form of air strikes, aerial reconnaissance, and airmobile operations. Ac-

tions that might be taken against such air attacks may be either passive or active. Because an active defense may also present danger to friendly troops and installations an active defense must be a command decision. The air defense plan of the supported headquarters, based on theater headquarters doctrine, will define when and how active or passive defense will be employed against enemy aircraft. Commanders must insure that their units are familiar with the air defense plans of the supported headquarters.

6-13. Passive Defense Measures

The effectiveness of enemy air attacks may be curtailed to some extent by employing passive measures such as camouflage and dispersion. Passive measures should always be in effect to decrease the possibility of surprise attack by enemy aircraft. Although the signal units of the signal brigade have a local air defense means, passive air defense measures constitute the primary internal actions taken by those units to avoid and to reduce the effect of enemy attack.

6-14. Active Defense Measures

Active defense against enemy aircraft is emphasized because large volumes of small arms fire are

capable of destroying both high-speed and low-speed aircraft or disrupting their attack. To maximize the effectiveness of organic weapons when employing them in an air defense role, the following actions should be taken:

a. Commanders must insure that their unit air defense SOP's are based on the SOP's of the supported headquarters. These SOP's must contain firm guidance on how to identify aircraft, the personnel who are to engage enemy aircraft, the techniques of fire to be used, the rules of engagement, and the controls to be exercised.

b. All personnel must be made aware of the effectiveness of a large volume of small-arms fire against low-flying aircraft. Emphasis must be placed on the aggressive engagement of hostile aircraft in accordance with the SOP.

c. All personnel must be well trained and kept current on aircraft identification, techniques of firing at aerial targets, fire discipline, and response to control methods. Extreme emphasis must be placed on the threat to friendly aircraft involved in failure to properly identify and discriminate between friendly and enemy aircraft. FM 44-30 provides information on visual aircraft recognition. FM 44-1 provides details on rules of engagement and firing procedures.

Section V. CHEMICAL, BIOLOGICAL, RADIOLOGICAL AND NUCLEAR DEFENSE

6-15. Defensive Measures

The use of unit chemical, biological, radiological, and nuclear defensive measures is necessary to permit the unit to operate effectively in a CBR toxic and contaminated environment (FM 21-40). These defensive measures include:

- a. Using chemical agent detectors and alarm systems.
- b. Wearing protective clothing and masks.
- c. Employing protective equipment.
- d. Using protective shelters.
- e. Dispersing personnel and equipment.
- f. Decontaminating equipment and personnel.
- g. Administering first aid.

6-16. Responsibilities

Unit readiness to operate with maximum indi-

vidual and unit effectiveness under conditions produced by either friendly or enemy employment of nuclear, chemical, or biological weapons is a command responsibility. In addition, individual members of the unit have responsibilities for certain general functions connected with CBR defensive operations.

a. *Individual Soldier.* The individual soldier learns individual and unit CBR protection procedures so that he can carry out his mission with the least risk of injury in a toxic or contaminated environment.

b. *Unit Officers and Noncommissioned Officers.* Unit officers and noncommissioned officers (NCO) insure that CBR defensive measures are taught to and applied by unit personnel.

6-17. CBR Organization and Training

The signal unit commander appoints on orders a CBR school-trained officer to the additional duty

of unit CBR officer. He also appoints on orders a CBR school-trained NCO to additional duty as the unit CBR NCO. A CBR school-trained alternate CBR NCO should also be appointed on orders. The specific assignments, equipment, and duties of these CBR personnel are designated in the CBR Annex to the unit SOP. Training in CBR defense must result in all personnel having the ability to carry out CBR defense instructions and, in the absence of specific instructions, to take the proper actions when faced with a chemical or biological attack or radiation hazards.

Section VI. TRAINING

6-19. General

a. The training objective of a signal unit is to help personnel to become proficient in their assigned tasks, to cross-train them in other related tasks, and to achieve the balance of skills and the cooperation necessary to achieve efficient individual, team, and unit performance. Training is continuous, and will always be concerned with some aspect of this important function. Broad training principles and policies to be used by all commanders are included in AR 350-1. Signal communications training considerations are discussed as a doctrinal matter in FM 24-1.

b. Training is conducted on an individual, group, or unit basis. It may consist of service school training, unit school training, on-the-job training (OJT), correspondence and extension courses, or any combination thereof. Training is supplemented, as required, by refresher courses to keep personnel and units informed of new methods, techniques, and equipment. A review of certain subjects, which may not be directly associated with the technical mission, is essential for maintaining proficiency in general military subjects. Subjects which must be reviewed periodically include military justice, CBR operations, internal defense and internal development operations, first aid, physical training, survival and escape procedures, qualification in arms, and the code of conduct.

c. Communicators should be trained to react properly to enemy attempts at jamming radio communications and to enemy instruction into nets with imitative communications. Signal security is a command responsibility and all responsible personnel should be indoctrinated on the contents of FM 32-5, FM 32-20, and FM 32-20A.

6-18. Army Medical Service

The army medical service provides the unit with medical treatment and with biological agent identification. In addition, the army medical service furnishes advice to unit commanders on the following subjects, as required: immunization procedures, field sanitation, first aid, capabilities of medical facilities, fitness of food, and the effects of CBR agents on personnel.

6-20. Responsibilities

The unit commander is responsible for insuring that all assigned or attached personnel are adequately trained. Emphasis must be placed upon the training of the soldier to enable him not only to perform his technical duties, but also to defend himself and his installation should the need arise. The unit commander and the unit training officer establish training programs, supervise the training and cross-training of the unit personnel, operate and supervise unit schools, furnish training assistance and advice where needed, and conduct training inspections. The unit recommends personnel to fill school quotas allocated by higher headquarters, and coordinates the training activities of the unit elements. Subordinate commanders are responsible for insuring that their personnel are trained for conducting on-the-job, individual, and refresher training; for providing qualified instructors, as necessary, to staff unit schools; for providing training materials to support schools established by the unit; and for selecting personnel to attend schools.

6-21. Methods

a. The army provides an extensive system of service schools to teach officers and enlisted personnel the special skills required to perform their duties effectively. It is desirable that the maximum number of personnel be school-trained and that full advantage be taken of quotas authorized by these schools. Prospective students must be carefully screened, however, to insure that they will be able to complete the courses of instruction successfully.

b. Unit training is conducted by using assigned personnel as instructors. Most company training is decentralized. Certain centralized training,

however, such as technical control training, can be best conducted at company level. This centralized training normally is consolidated because of limited platoon training facilities, complexity of subject matter, or the need for close supervision and evaluation by the company commander and the training officer. Unit training provides instruction to those who cannot attend school courses and gives special instruction not provided by service schools. Unit training may be necessitated by the receipt of new equipment; modifications made to existing equipment/changes in procedure, mission, or doctrine; or changes in methods of operation. Because of the nature of signal unit missions, technical training is fre-

quently fragmented with emphasis placed upon individual, team, and platoon training.

c. On-the-job training is a process whereby students or trainees acquire knowledge and skills through actual performance of duties under competent supervision, in accordance with an approved, planned program. The most effective method of OJT is to group experienced specialists with untrained personnel. Untrained personnel are given the simpler jobs to perform until proficiency is attained. Later, as experience is gained and skills are developed, these personnel are permitted to undertake tasks that are progressively more complex.

CHAPTER 7

SUPPLY AND MAINTENANCE

Section I. SUPPLY

7-1. Supply Responsibilities

The acquisition and the timely distribution of adequate supplies are essential to the successful accomplishment of a signal unit's communications mission. Commanders must be familiar with the status of supplies and equipment at all times and must thoroughly consider the combat service support required for current and future operations. The supply officer insures that the unit logistical support system is flexible and responsive to the requirements of the unit elements. He is responsible for the preparation of the supply portion of operations orders and plans, and the supervision of supply functions. Proper planning, maintaining current records, and supervision are required to insure the steady flow of supplies required by the unit in the performance of its mission.

7-2. Deployment Considerations

Because some signal elements are deployed over extensive areas, logistical support for these elements is a major problem. Before deployment of any element, the unit commander or the supply officer will coordinate supply plans with the S4 of the next superior command or with the supporting FASCOM or ASCOM unit depending on unit assignment and deployment so that the appropriate unit of the FASCOM or ASCOM can be alerted to an upcoming support requirement. Upon or before arrival at his operational site, it is the responsibility of a deployed element commander to establish liaison with the designated FASCOM or ASCOM unit that has been alerted to provide combat service support to his element.

7-3. Supply Operations

a. Supply operations are geared to produce effective supply support for a unit and its deployed elements. Internal supply procedures must implement and facilitate responsiveness in the unit supply system. Although supply procedures must conform with the criteria established by AR 735-35 and other pertinent supply directives (see

A), the requisitioning and distribution of supplies may be influenced by the factors listed below:

- (1) Dispersement of organic units and elements.
- (2) Transportation.
- (3) Supply sources.
- (4) Mission to be performed.
- (5) Local security.
- (6) Availability of air resupply.

b. Commanders must give command supervision to the practice of conservation of supplies and material by all personnel of their command. The commander, through specific supply economy directives and frequent inspections, insures that equipment and material receive proper care and that they are maintained in a high state of readiness at all times.

c. Supply procedures and techniques for internal defense and internal development operations require special planning because of the hazards that may be encountered along roads and at isolated operational sites and upon the possible dependence on aerial supply. Supply planning must consider the stockage of required quantities of essential items and the planning of resupply well in advance of the normal requisitioning cycle.

7-4. Combat Service Support, Field Army Support Command

The field army support command provides combat service support to the field army except engine construction services. The FASCOM provides combat service support through two kinds of major subordinate elements: army-wide service organizations and support brigades.

a. Army-Wide Service Organizations. Army-wide service organizations such as ammunition, medical, military police, and transportation units are provided throughout the field army area by separate brigade size organizations.

b. Support Brigades. The separate support brigades provide supply, maintenance, and specialized services in a designated area. A corps support brigade is employed in the corps area and an army support brigade is employed in the army service area. The support brigades provide a variety of services (supply, maintenance, postal, finance, laundry, bath, grave registration) within their assigned areas. Their primary missions are supply and maintenance of all equipment and supplies except those provided by army-wide service brigades. Each of the corps support brigades provides general support to the divisions and both direct and general support to nondivisional units in the corps area. The army support brigade provides direct and general support to the units in the army service areas.

7-5. Combat Service Support, Theater Army Support Command

The mission of the TASCOT is to provide combat service support to army forces in a theater of op-

erations. Services provided include general support to the field army, direct and general support to the communications zone, and rear area security and area damage control within a communications zone.

a. Functions. Combat service support functions performed by the TASCOT include administration, civil affairs, engineer, maintenance, medical, military police, movements, personnel, legal, field services, comptroller and finance, supply, and transportation.

b. Organization. The TASCOT is normally organized with the following major subordinate commands:

- (1) Area support.
- (2) Engineer.
- (3) Medical.
- (4) Personnel.
- (5) Supply and maintenance.
- (6) Transportation.

Section II. MAINTENANCE

7-6. Maintenance Responsibilities

Maintenance of equipment includes all actions taken to retain materiel in a serviceable condition or to restore it to serviceability. It includes the routine care exercised by operators and users, as well as the repair, rebuilding, and overhaul performed by trained technicians. The army materiel maintenance system is divided into four categories: organizational maintenance, direct support maintenance, general support maintenance, and depot maintenance (AR 310-25 and AR 750-1). These categories, which are based upon the extent of the capabilities, facilities, and skills required to perform authorized maintenance operations, are used as the means of designating the scope of maintenance to be performed at the various command levels. Commanders at all levels are responsible for compliance with established practices and procedures for preventive maintenance operations, for the training of personnel in their command in preventive maintenance of equipment, for insuring that proper security safeguards are in effect during maintenance tests, and for the allocation of sufficient time to perform the required preventive maintenance.

a. Commanders, maintenance section chiefs, and subordinate commanders must give priority and personal attention to the preventive maintenance program. They must know the equipment

and demonstrate their interest by personal supervision of maintenance operations and by frequent informal inspections. Command maintenance management inspections, conducted as prescribed by AR 750-8, insure the commander that proper maintenance is being performed on all major items of equipment and that the appropriate preventive maintenance information contained in DA PAM 750-1 and in the equipment technical manual is being applied. Details on the preparation and use of maintenance performance records are contained in TM 38-750 and TM 38-750-1. Additional maintenance reference publications are listed in appendix A.

b. It is the responsibility of each officer, warrant officer, and noncommissioned officer, and enlisted man to initiate on-the-spot corrective action whenever he observes deficiencies in the condition or operation of equipment. Evidence of abuse will be immediately investigated and corrective action taken. Some common abuses are:

- (1) Improper, careless, or negligent use of equipment.
- (2) Lack of lubrication, overlubrication, or use of unauthorized lubricants.
- (3) Deferred maintenance, including lack of proper servicing.

- (4) Attempted repairs by unauthorized personnel or the use of improper tools.
- (5) Failure to assign direct maintenance responsibility.
- (6) Lack of adequate inspection.
- (7) Unauthorized cannibalization.

7-7. Organizational Maintenance

Signal units have the capability of performing organizational maintenance on organic weapons, vehicles, power generators, and electronic equipment. With reference to organic weapons and vehicles of company elements, the organizational maintenance capability of the company elements is augmented by company level maintenance personnel assigned to the company headquarters.

7-8. Maintenance Support Beyond Organizational Level

Most signal units have a direct support level maintenance capability on organic COMMEL equipment. With this direct support level capability and capacity of the unit is exceeded, the unit commander or the maintenance section chief will

coordinate maintenance support requirements with the supporting DS maintenance unit. In addition, the unit commander or the maintenance section chief makes the necessary arrangements for the continuous maintenance support of deployed units or elements of the unit. When an item requires maintenance or repairs beyond the unit capability, it is evacuated to the supporting direct support unit, which then assumes the responsibility for further evacuation of the item to the general support maintenance level if required. Detailed procedures for supply and maintenance are provided in the maintenance support plans of the field army support brigade and the TASCOT major subordinate commands furnishing these services. Refer to FM 29-22 for further information on maintenance operations in the field.

7-9. Maintenance Data Collection

Commanders at all echelons, in accordance with AR 750-1, must insure that data generated by the army equipment records procedures are accurately recorded and used in maintenance management. The system and its procedures are described in TM 38-750 and TM 38-750-1.

PART TWO

SIGNAL ORGANIZATIONS

CHAPTER 8

ARMY SIGNAL BRIGADE (FIELD ARMY)

Section I. BRIGADE CHARACTERISTICS

8-1. Introduction

a. Technological advances in weapons, their tactical employment, and increased mobility on the battlefield place a requirement upon the field army commander for greater dispersion of his resources. Dispersed deployment places a requirement upon the field army commander for more stringent command control over his resources. The commander must have means to direct the concentration of his resources against an enemy, strike decisively, and disperse again without providing the enemy with a profitable retaliatory target. To do this, the combat reaction time of tactical combat elements must be reduced and elements of the field army's combat support and combat service support units must also react rapidly to keep pace with the combat forces. The field army commander must, therefore, have reliable signal communications responsive to his needs for command and control so that he can readily influence tactical operations of subordinate commanders. He must also provide combat support unit commanders and combat service support units assigned to the field army support command (FASCOM) with signal communications to effectively support combat operations.

b. The army signal brigade is the signal unit assigned to a field army headquarters to assist the army commander in accomplishing his mission. It is capable of providing both command signal communications and area signal communications. The signal brigade commander is responsible for the installation, operation, maintenance, and operational control of all signal communications provided by the brigade.

c. The army signal officer has staff responsibility for integrating signal communications systems established by the corps, divisions, and air

defense artillery brigade signal units with the field army command and area systems to form the integrated field army communications systems network.

8-2. Mission

The mission of the army signal brigade is to provide command and area communications systems (less those signal systems organic to corps, divisions and air defense artillery brigade) for a field army.

8-3. Assignment and Allocation

This brigade is assigned to a field army or to a task force of comparable size that requires the support of a signal brigade. One signal brigade is allocated per field army or comparable size task force.

8-4. Capabilities

The army signal brigade has the capability to:

a. Provide command and control for all assigned and attached signal units.

b. Direct the installation, operation, and maintenance of multimeans, multiaxes, multichannel signal systems and facilities required to implement army signal plans developed by the field army signal officer.

c. Maintain direct control over operations of the field army communications systems established by its assigned or attached signal units.

d. Exercise that degree of technical control over communication terminals of supported units, using the army area system, to insure the required quality of circuits through this system.

e. Integrate organic communications system of major subordinate commands and adjacent major U.S. and/or allied commands with the field army

communications systems established by the brigade.

8-5. Limitations

The army signal brigade depends upon the U.S. Army Strategic Communications Command (theater) to provide communications facilities for ac-

cess to the Theater Army Communications Systems (TACS).

8-6. Category and Mobility

The category and mobility of units assigned to the army signal brigade is stated separately for each unit in the chapter applicable to the unit.

Section II. ORGANIZATION AND EMPLOYMENT

8-7. Introduction

The army signal brigade is not a fixed type signal organization. The size and composition of the brigade may vary in different field army areas. All signal brigade organizations are similar in this respect. They have a command and control unit (headquarters and headquarters company) and signal battalions capable of installing, operating, and maintaining field army command and area communications systems. Other signal units (separate companies and teams) may be assigned or attached to augment this capability or to perform special signal communications functions.

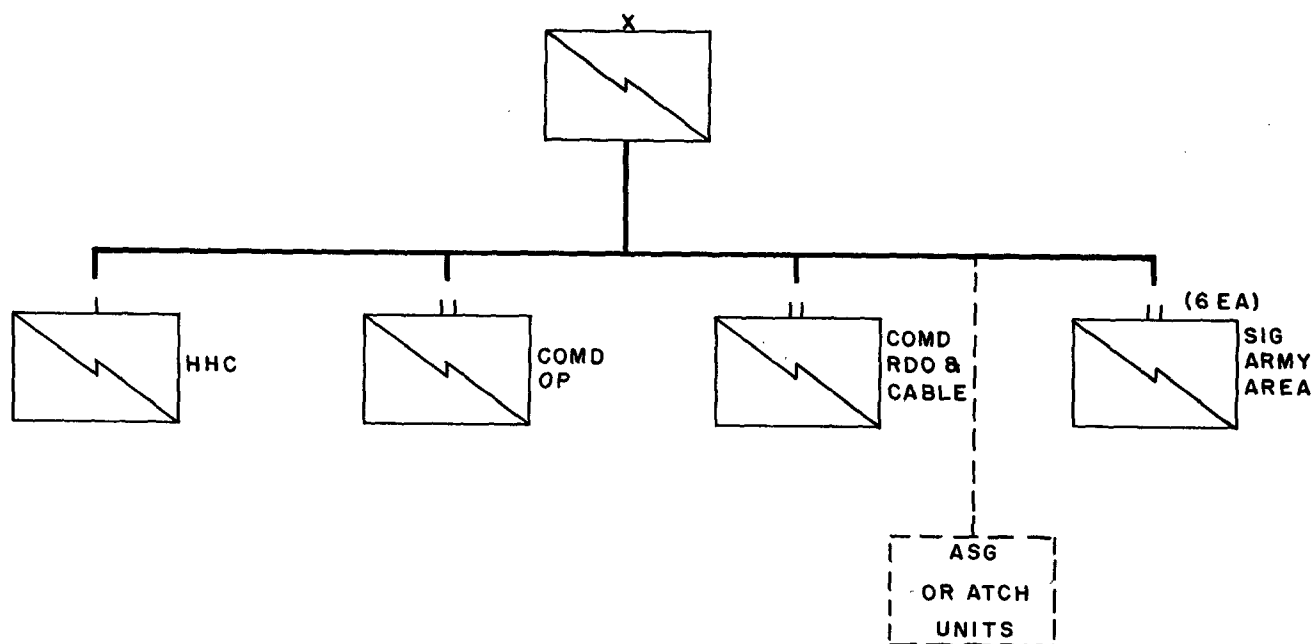
8-8. Organization

The brigade organization discussed in this chapter incorporates signal units authorized by current tables of organization and equipment. The basic brigade structure (fig. 8-1) consists of a

headquarters and headquarters company, TOE 11-102; an army command signal radio and cable battalion, TOE 11-75; an army command signal operations battalion, TOE 11-95; and six signal army area battalions, TOE 11-85. This signal unit grouping is capable of accomplishing the army signal brigade mission (para 8-2) in support of the field army organization referred to in chapter 2.

8-9. Employment

The brigade is employed as a major subordinate command of the field army to which it is assigned. The signal brigade commander is responsible to the army commander for command control and for the utilization of all signal units assigned to the brigade. He employs his subordinate units to implement the army signal plan developed by the army signal officer.



FM 11-125-8-1

Figure 8-1. Type organization field army signal brigade.

Section III. METHOD OF OPERATION

8-10. Introduction

General system design and capabilities of command and area communications systems are discussed in Part One. The systems are similar in that each is a multimeans, multiaxes, multichannel, signal communications system. Each system uses similar equipment, and is responsive to user needs. They differ primarily in deployment and, to a great extent, in the type traffic they handle and the users they support. Command communications systems are found at all levels of command within a field army but there is only one army area communications system for a field army. The army signal brigade is responsible for establishing and controlling the command signal communications system at army headquarters level and for establishing and controlling the field army area communications system.

8-11. Brigade Command and Communications Systems Control

a. The brigade commander has a twofold mission. He is responsible for maintaining command control over all units assigned or attached to the brigade and for maintaining centralized control over operations of the signal communications systems they provide. He is responsible for implementing the army staff signal officer's plans for integrating communications systems organic to headquarters of major subordinate commands with the army command-plus-area communications system established by his brigade. The headquarters and headquarters company (HHC) assigned to the signal brigade provides him with the means to accomplish his mission.

b. The headquarters and headquarters company operates as the brigade's command and control element. Staff officers assigned to the brigade headquarters work with battalion staff officers on a continuing basis. Operating sections organic to the headquarters company support the brigade staff and also perform certain signal communication functions. The brigade's communication systems control function is performed by the systems control (SYSCON) section. The SYSCON section prepares and disseminates current signal plans and policies to the operating battalions. It coordinates and controls operations of the communications network established by the operating battalions. The brigade SYSCON also coordinates integration of the army command and area systems with the communications systems organic to

major field army subordinate echelons. Refer to chapter 9 for a complete discussion pertaining to the operations of a headquarters and headquarters company, army signal brigade.

8-12. Command Communications System (Field Army Headquarters)

Installation and subsequent operation and maintenance of a command communications system at field army headquarters command level requires the communications electronics (COMMEL) resources of two of the brigade's signal battalions. Each battalion depends upon the other to provide certain specific facilities for the command system. The brigade SYSCON develops command communication system plans based on field army headquarters requirements and the COMMEL resources of the two battalions. It provides technical direction to the battalions during system installation and maintains control over operations of the completed system.

a. *Army Command Signal Operations Battalion.* This battalion establishes a command signal center and installs, operates, and maintains the internal signal communications complex at echelons of the field army headquarters. The battalion also establishes and operates a scheduled command signal messenger system (motor and air). The messenger system operates between echelons of the army headquarters and the command headquarters of designated major subordinate commands. Doctrinal employment and the battalion's method of operation to accomplish these tasks are discussed in chapters 17 through 20.

b. *Army Command Signal Radio and Cable Battalion.* This battalion installs, operates, and maintains the long distance command communications facilities between echelons of the field army headquarters and the command headquarters of designated major subordinate commands. These facilities include point-to-point multichannel radio trunk links, single channel radio nets, and multichannel coaxial cable systems. Elements of the battalion also provide cable and wire support at echelons of the field army headquarters for operating elements of the command operations battalion. In cases where cable system requirements exceed the radio and cable battalion's capabilities, additional cable construction support is provided from resources available to the signal brigade. Doctrinal employment of the radio and cable battalion and its method of operation to ac-

comply with these tasks are discussed in chapters 14 through 16.

c. Command System Characteristics. Deployment of the field army command communications system follows doctrinal principles for tactical command communications systems found in FM 24-1. The system is deployed from senior to subordinate headquarters and laterally from left to right to the command headquarters of adjacent coequal headquarters. The boundaries of the system are determined by the location of the command headquarters served by the system. The signal brigade commander can readily direct reorientation of the system to meet changing tactical situations. The shelter inclosed, vehicle mounted signal communications equipments (organic to the operating battalions) promote rapid deployment and displacement of system. The command system deployment also provides continuity of communications during the displacement of army headquarters. The command system assures the requisite quantity and quality of communications for command control of tactical operations. It provides the means for maximum responsiveness to tactical requirements. The system is designed primarily for handling all types of written, printed, oral, data, facsimile and video tactical signal communications traffic by either secure electrical and/or messenger means. Traffic passed over this system is related to current or impending tactical operations.

d. Command System Users. Primary users of the command communications system are the field army commander, FATOC staff officers, and other personnel directly involved with tactical operations. They communicate with their counterparts at the subordinate tactical command headquarters. They also use this system to communicate with their counterparts at command headquarters of army combat support units (for example, army aviation, intelligence, fire support) directly supporting tactical operations. Tactical operations traffic passed over this system is generally high priority traffic requiring immediate action.

8-13. Area Communications System (Field Army Area)

The signal brigade commander utilizes the COMMEL resources of six signal army area battalions to provide area communications support for the field army organization referred to in chapter 2. The field army area is that geographical area located between the field army rear boundary and

the rear boundaries of the combat divisions. The brigade commander assigns an area of responsibility within the field army area to each signal army area battalion. The battalions have identical resources and capabilities. Adjacent battalions are mutually dependent upon each other's COMMEL resources for interconnecting battalion area system segments to form the overall army area communications system. The systems control branch of the army signal brigade provides systems engineering information to each battalion during system installation and coordinates the interconnecting of area segments to form the overall army area communications system.

a. Signal Army Area Battalion. Operation of a signal army area battalion consists of establishing four army area signal centers (AASC) in its area of responsibility. The centers are connected by long distance multichannel radio and cable communications facilities to form a segment of the long distance area communications system. The area centers of one battalion are connected to area centers of adjacent battalions. The interconnected area system segments thus form the field army area communications system. Each area center throughout the system establishes and operates communication center facilities to meet user needs. It also installs and maintains area system access trunks or trunk groups. This secondary trunking system provides users located from 5 km to 40 km from the AASC with a means of access to the primary long distance trunk network established between area centers. The brigade SYSCON uses direct communications means backed up by existing circuits of the army area communications system to maintain contact with the S3 section of each assigned operating battalion. This method of operation assures availability of technical communications channels and permits rapid transmission of technical information and directives for system operation. Each signal army area battalion assigned to the brigade receives communications system operations directives pertaining to its areas of responsibility through these technical communications channels. Each battalion also provides resources to establish an area signal messenger system. Although the general areas for deployment of area signal centers, the designation of units to be supported, and the degree of support required will be determined by the signal brigade, the exact siting of these centers, coordination with supported units, and the technical proficiency of all communication support provided are battalion responsibilities. In addition, the battalion and its subordi-

nate units normally will be responsible for determining future or additional communications support requirements of supported units within the battalions' area of responsibility.

b. Area System Characteristics. Deployment of the area communications system follows doctrinal principles found in FM 24-1. The system is deployed throughout the length and breadth of the geographical field army and corps areas. It may also extend into rear areas of the combat divisions. Army area signal centers are not deployed symmetrically throughout this area, but are placed at random points where user requirements are the greatest. The boundaries of the system are those of the geographical field army area. The signal brigade commander can readily direct (through the brigade SYSCON) redeployment of AASC to meet the requirements of shifting troop population within the army area. The mobility of the signal communication equipment configurations promotes rapid deployment of the system and displacement of army area signal centers. During displacement of area signal centers, the system design provides users with continuity of communication through trunk patching and switching facilities of other in-place area signal centers. The area system assures the requisite quantity and quality of communications for field army administrative and logistical operations. The system is designed primarily to provide signal communications for combat support units and combat service support units located in the field army area. The system has the same signal communication handling capabilities as the command system (para 8-12c).

c. Area System Users. Primary users of the system are the field army support command and the field army and corps combat support organizations. Included as primary users are subordinate units of these organizations. Independent units performing similar combat support and combat service support functions and all division support command headquarters are also primary users. The signal brigade receives, analyzes, and processes the user requirements. It then directs the army area signal battalions to deploy AASC to best satisfy requirements. Detailed operations of an area battalion are discussed in chapters 19 through 21.

8-14. Integration of Field Army Communications Systems

Echelons of field army command headquarters and those of all assigned or attached corps are provided access to the field army area system by the signal brigade. Access links are installed between the closest AASC and the respective command headquarters echelon. The echelons of each division headquarters are provided access through their respective division support command headquarters.

This communication system design is referred to as the field army command-plus-area system. All major command headquarters systems are connected directly at successive levels of command. They are also connected indirectly through the army areas system established by the signal brigade.

CHAPTER 9

HEADQUARTERS AND HEADQUARTERS COMPANY ARMY SIGNAL BRIGADE

Section I. UNIT CHARACTERISTICS

9-1. Introduction

The headquarters and headquarters company (HHC), army signal brigade is a command and control unit. The brigade commander uses the unit resources to discharge his command and COMMEL responsibilities. Operationally, the unit differs from other command type headquarters because of mission requirements. In addition to providing command control and staff supervision, it also has a mission responsibility for maintaining control over operations of the communications systems established by signal units assigned to the brigade. This chapter deals specifically with unit characteristics, organization, and method of operation of the HHC army signal brigade.

9-2. Mission

The mission of the HHC of a type army signal brigade is to provide the commander with the means to command assigned and attached units and to formulate and direct implementation of overall plans, policies, and procedures for the installation, operations maintenance, and management of the field army area communications system, excluding corps and division systems.

9-3. Assignment and Allocation

The HHC is assigned to the field army signal brigade and is allocated on a basis of one HHC per signal brigade.

9-4. Capabilities

The HHC has the capability to:

a. Provide command, control, staff planning, and supervision over brigade operations.

b. Direct the training and coordinate administrative and logistical support of the assigned and attached units.

c. Provide organic administration, supply, and mess facilities for brigade headquarters.

d. Provide a SYSCON element to plan, supervise, and control the area communications system and the command communications system for a field army.

e. Provide ground photographic service required by a field army headquarters and army troops, to include still and motion picture support, but excluding the processing of exposed motion picture and color film.

f. Provide technical assistance to the field army signal section as required.

g. Install, operate, and maintain organic signal equipment for brigade headquarters, exclusive of cryptographic maintenance.

h. Perform organizational maintenance on arms and motor vehicles and direct support maintenance on signal equipment (exclusive of cryptographic) organic to brigade headquarters.

i. Install, maintain, and operate the brigade headquarters internal signal communications facilities.

j. Provide policy and guidance on brigade logistics.

9-5. Limitations

a. The HHC SYSCON element depends upon other assigned signal units to provide circuits for effective communications system control.

b. The HHC depends upon combat service support organizations in its area for medical, dental, and military pay services. It also depends upon these organizations for additional motor or air transportation.

9-6. Category and Mobility

a. The headquarters and headquarters company, army signal brigade is designated as a category II unit (AR 310-25). The company is 75

percent mobile when restricted to organic transportation.

b. Category and mobility of TOE units as-

signed or attached to the brigade may be found in the unit TOE and in the chapter relating to the specific unit.

Section II. ORGANIZATION AND EMPLOYMENT

9-7. Introduction

The command and control unit organized under TOE 11-102 provides the organizational structure and a nucleus of professional and technical COMME and administrative personnel to provide command and control for all units assigned or attached to the signal brigade. This organization provides centralized control over operations of all communications systems established by signal units of the brigade. Elements of this unit maintain close coordination and liaison with corps, division, and air defense artillery signal units and with signal units of higher and adjacent commands. They also establish field army level signal training activities to update the technical skills of personnel assigned to the various signal units. This is particularly necessary when new signal communications equipment is introduced into the field army inventory or when new signal communications techniques are developed using existing COMME materiel.

9-8. Organization

a. The headquarters and headquarters company is organized as shown in figure 9-1. The brigade headquarters consists of the commander and the brigade staff. The brigade commander is a general officer. The staff is organized to perform general, special, and personnel staff functions for the brigade commander.

b. The headquarters company is organized to provide support for the commander and his staff and to provide company level command control. The brigade communications platoon organization includes personnel and equipment for a platoon headquarters, radio section, wire section, and a message center section. The systems control and operations section is organized on a functional basis to support the brigade mission. These functions and those of all other sections organic to the HHC are discussed in paragraphs 9-11 through 9-21.

9-9. Employment

a. The headquarters and headquarters company is employed as a major subordinate unit of the army signal brigade. The brigade commander employs the HHC resources to control signal units assigned or attached to the brigade and to maintain centralized control over operation of the communications systems they establish.

b. The HHC is employed to provide brigade level administrative, logistic and technical support for the commander, his staff and all brigade units. Elements of the HHC also perform the housekeeping functions for the brigade headquarters, such as providing mess facilities, and supply and motor vehicle maintenance.

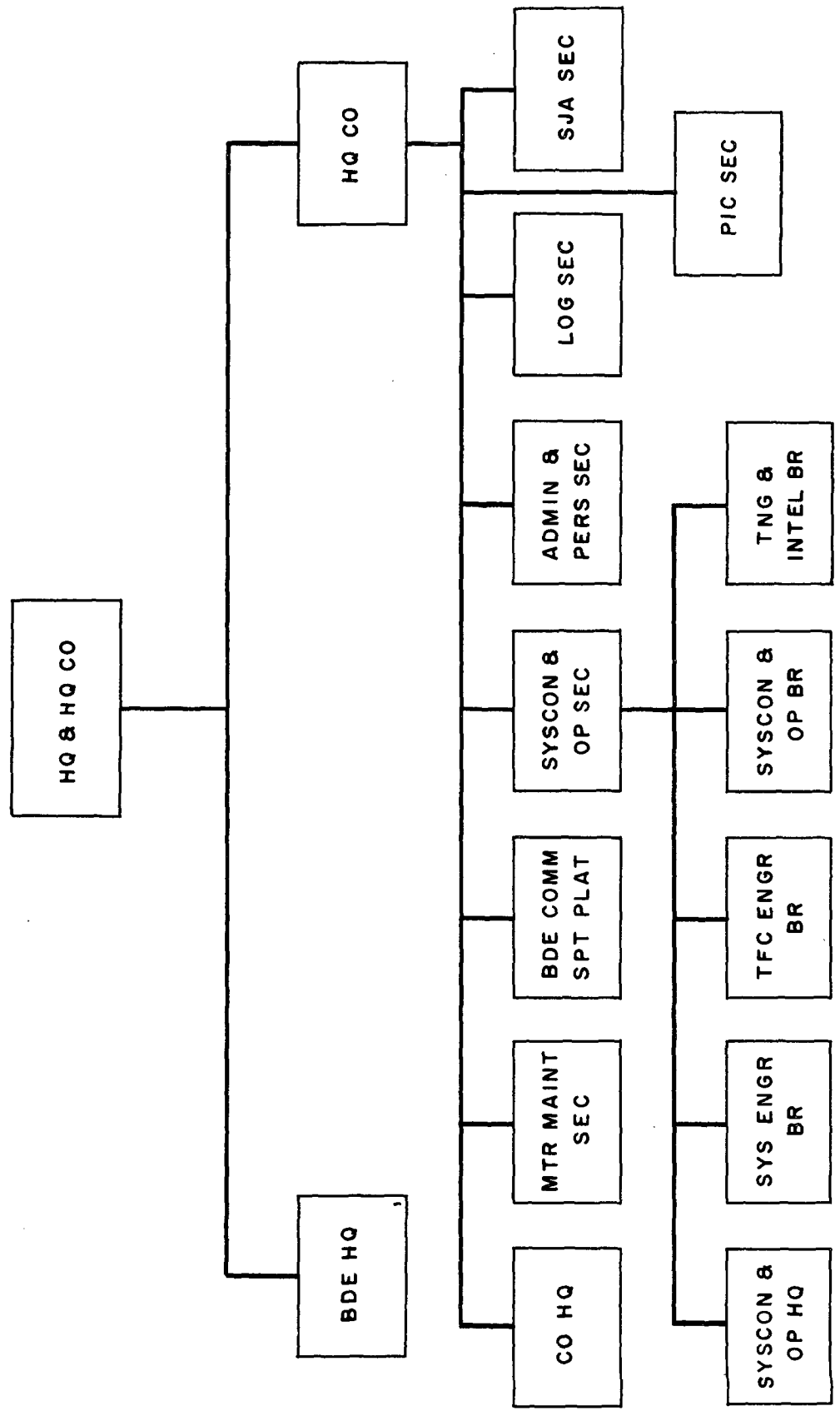
Section III. METHOD OF OPERATION

9-10. Introduction

The mission of the army signal brigade requires that its assigned signal units provide both command and area signal communication 24 hours a day. This places a requirement on elements of the brigade staff to operate in a like manner. This is particularly true of the systems control and operations section because it is actively engaged in maintaining control over operation of these systems. The headquarters and headquarters company's operations discussed in this chapter are applicable in all areas of operation and under all conditions of warfare. It is recognized that techniques used to execute the method of operation may vary with particular tactical situations within the army area of operation.

9-11. Brigade Headquarters

Brigade headquarters consists of the brigade commander, his staff, and the necessary personnel to provide command, control, and administrative, tactical, and operational supervision over all units assigned or attached to the brigade. The brigade commander exercises command over the signal units assigned or attached to the brigade. The attached or assigned signal unit commanders are his principal subordinates, and his relation with them is direct and personal. The brigade commander, as one of the principal subordinate commanders of the army commander, operates directly under the field army commander and has direct access to him at all times.



FM 11-125-9-1

Figure 9-1. Type organization HHC, army signal brigade.

9-12. Brigade Staff

a. The primary purpose of the brigade staff is to assist the brigade commander in the exercise of his command. Staff actions must be thorough and accomplished rapidly. Recommendations must be submitted promptly, and instructions, based on the commander's decision, issued without delay. Efficient staff actions reduce the number of details requiring command action, thereby freeing the commander for more important functions.

b. Brigade staff officers must establish and maintain close and harmonious relationships with the commanders and staffs of attached, assigned, or supported units. Frequent staff visits to these units will accomplish the intended purpose and assist the staff in supervising and coordinating the execution of the commander's orders and decisions. In addition, close coordination is effected between the brigade staff officers and those of the signal section.

c. The brigade staff operates under the supervision of the brigade executive officer, and functions within the framework of the policies, guidance, and authority prescribed by the brigade commander. The commander must keep his staff officers informed of his plans, policies, and decisions to enable them to discharge their duties efficiently.

d. See FM 101-5 for a general discussion of staff organization and procedure.

e. The brigade executive officer is one of the principal assistants and advisors to the brigade commander. His functions and responsibilities are similar to those of a chief of staff. He supervises the operations of the brigade staff, and represents and acts for the brigade commander during the absence of the latter. The executive officer normally is located at the brigade main command post. When the command post displaces, the executive officer normally moves with the last element of the headquarters to displace. Additional staff officers are assigned as follows:

(1) *S1 (adjutant)*. The S1 has staff responsibility for personnel activities and other administrative matters not specifically assigned to another staff officer. He supervises the headquarters commandant (an added duty of the headquarters company commander) in administrative matters pertaining to the brigade headquarters. He exercises staff supervision over the brigade chaplain and the S1 activities of attached and assigned

units. He operationally controls the administration and personnel section of brigade headquarters and is responsible for the functions listed in paragraph 9-17.

(2) *S2 (intelligence officer)*. The intelligence officer provides information to the brigade commander on all matters pertaining to the physical security of brigade installations and communications security (COMSEC) over the field army communications system. He prepares directives for internal and area security for brigade headquarters and for units assigned and attached to the brigade. He supervises the evacuation of captured enemy materiel which contains intelligence value. He disseminates information and intelligence concerning the enemy, terrain, and weather; supervises and coordinates counterintelligence measures; determines the requirement for maps and arranges for their distribution; determines the policy and procedures necessary to obtain in-the-field MOS clearances; and supervises and coordinates brigade training in intelligence matters.

(3) *S3 (operations officer)*. The S3 is responsible to the brigade commander for the organization, operations, and training of the brigade. His principal duties include preparing the signal estimate of the situation in the field army area (to include facilities required, units and headquarters supported, estimates of communication traffic loads, establishment of circuit priorities, circuit restoration and construction of facilities). He exercises operational control over the pictorial section of the company and, by means of the system control and operations section, manages and controls the field army signal communications system. Specifically, the S3:

(a) Keeps the brigade commander informed of the enemy situation as it affects the brigade, brigade operations, and the field army communications system.

(b) Prepares the brigade operations order.

(c) Plans and prepares training directives, programs, and orders.

(d) Supervises and directs field exercises and maneuvers.

(e) Selects training areas.

(f) Organizes and supervises brigade and battalion specialist schools.

(g) Serves as the brigade information and education officer.

(h) Makes training inspections and analyzes training records.

(i) Provides information and makes recommendations to the brigade commander for the employment of the brigade.

(j) Maintains a situation map to keep the command informed of the location of signal centers, command posts, repeater stations, relay stations, etc.

(k) Supervises the movement of units assigned or attached to the brigade.

(l) Recommends the location of the brigade CP and the location of the headquarters of the several battalions.

(m) Prepares the brigade SOP.

(4) *S4 (supply officer)*. The brigade S4 has staff responsibility for the brigade logistics system. His role normally is one of control, coordination, and supervision since the battalions and other units assigned or attached to the brigade are logistically supported by appropriate support type units of the field army support command. His principal responsibility is to insure that logistical support is coordinated and adequate to support the activities of the brigade. Specifically, the S4 is responsible for:

(a) The determination of broad requirements for supplies and equipment.

(b) The establishment of priorities and allocations.

(c) The preparation of policies, plans, and directives for combat service support.

(d) Coordination with the field army G4 and the field army support command on logistical matters of importance to the signal brigade.

(e) Supervision and coordination of the Army Reporting System (TARS).

(f) Supervision and execution of those rear area security measures prescribed by the brigade commander.

(g) Area damage control planning and the integration of the area damage control plan with that of FASCOM headquarters.

(h) The development and review of plans for forthcoming operations.

(i) Conducting staff inspections and providing technical assistance when requested by subordinate units.

(5) *S5 (Civil Military Operations officer)*. When authorized, the civil military operations officer is the principle staff assistant to the commander in all matters pertaining to political, economic, sociological, and psychological aspects of military operations. A complete list of the S5

functions can be found in FM 101-5. When there is no S5, the S3 will assume the S5 responsibility.

(6) *Communication liaison officers*. The communication liaison officers assigned to brigade headquarters operate as a part of the brigade staff, normally under the supervision of the brigade executive officer. Each liaison officer is equipped with a vehicular single sideband (SSB) radio and a frequency modulated (FM) radio. Liaison officers may be provided with aircraft, if required, to accomplish their missions. Their primary responsibility is to:

(a) Maintain continuity in the exchange of information and to promote cooperation and coordination among field army headquarters, FASCOM headquarters, and other field army troops as required;

(b) Determine communications requirements and projected moves and displacements of supported units;

(c) Keep the brigade commander and his staff abreast of tactical, administrative, and logistical matters which affect the brigade.

(d) Provide liaison with adjacent U.S. or allied signal organizations, the theater army (COMMZ) signal organization, attached or assigned allied field army units; and indigenous commercial communication organizations.

(7) *Inspector general*. The inspector general inspects and reports upon such inspections, investigations, and studies as are required by law and regulations and upon those which are directed by the brigade commander. Additionally, he inquires into and reports upon matters which pertain to the performance of the mission and the discipline, efficiency, and economy of the command and performs other duties as prescribed by the commander.

(8) *Staff chaplain*. The staff chaplain advises the commander on the use of chaplains in brigade units. He furnishes estimates and information, and makes recommendations and plans in the areas of religion, morale, and morality. He coordinates religious activities of the brigade and establishes liaison with chaplains of higher, adjacent, and subordinate commands to insure religious coverage for all units and operating elements of the brigade.

9-13. Headquarters Company

Headquarters company consists of a company headquarters, a motor maintenance section, a brigade communications support platoon, a system

control and operations section, an administration and personnel section, a logistics section, an aviation section, a pictorial section, and a staff judge advocate section.

9-14. Company Headquarters

a. Company headquarters provides the direction and logistical support necessary for the company to function as a coordinated organization in the performance of its mission. It provides the means by which the company commander exercises command supervision over the activities of the company. Company headquarters and those elements of the company not required to operate in the field army headquarters area (motor pool, company mess, unit supply, pictorial section, logistics section, etc.) normally are located in a bivouac area within a short distance of army headquarters. It usually operates in one section.

b. Supply personnel maintain company supply records; consolidate requests and requisitions from operating elements; pick up common items of supply, repair parts and repaired equipment from depots, supply units, or maintenance units, as appropriate; and prepare other reports as required by army headquarters. The armorer assigned to company headquarters performs organizational maintenance on unit weapons.

c. Mess personnel assigned to company headquarters normally will establish and operate mess facilities in the company bivouac area. These facilities will be used to mess those personnel not required for operations in the command post area. Through prior arrangement, brigade headquarters personnel, whose normal place of duty is in the command post area, may mess with headquarters company, army. In this event, the signal brigade headquarters company may augment the mess personnel operating in the headquarters area.

d. Maintenance data personnel are assigned to the company to provide a uniform equipment records system used in the control, operations, and maintenance of army equipment used in the signal brigade. The items of equipment to be reported and details on the operation of the system may be found in TM 38-750.

9-15. The Motor Maintenance Section

The motor maintenance section provides motor maintenance and power generator personnel to perform organization maintenance on motor vehicles, trailers, and power generators organic to the

headquarters. The section chief (auto maintenance technician) also functions as the brigade motor officer. In this capacity he:

a. Acts as the principal assistant to the brigade commander in matters concerning automotive maintenance and the utilization and control of transportation within the brigade.

b. Supervises the activities of the brigade motor maintenance section.

c. Controls transportation operating under the direct control of brigade headquarters.

d. Arranges to provide supplemental motor maintenance support for the signal battalions of the brigade.

e. Supervises the maintenance of power generators for the brigade.

9-16. Administrative and Personnel Section

The administrative and personnel section is under the operational control of the brigade S1. Specifically, the S1 is responsible for the planning, coordination, supervision, and accomplishment of personnel functions within the brigade. He publishes the orders of the brigade commander. He advises the commander on the administrative and personnel situation of the brigade. His functions include but are not limited to:

a. Preparing strength reports.

b. Receipt of replacements and their assignment to appropriate battalions of the brigade.

c. Submitting recommendations for citations, decorations, honors, and awards.

d. Supervising the distribution and collection of mail for brigade headquarters.

e. Supervising the leave program and other morale activities, such as athletic and recreation programs, and coordinating religious activities with the brigade chaplain.

f. Carrying out civil affairs functions delegated to the brigade.

g. Supervising personnel procedures and adjustments; recommending transfers, assignments, reassignments, promotions, demotions, classification, and reclassification of personnel; and carrying out and implementing the principles of personnel management.

h. Supervising movement, internal arrangement, internal organization, and internal opera-

tion of the headquarters, and arranging for quartering parties.

i. Acting as civilian employee officer to include procurement, utilization, and administration of indigenous civilian employees.

j. Maintaining the unit journal.

k. Maintaining records for brigade headquarters.

l. Preparing the administrative portion of the brigade SOP.

m. Accomplishing other functions as directed by the brigade commander.

9-17. Logistics Section

The logistics section, under the operational control of the brigade S4, is the operating element through which the S4 discharges his logistics responsibilities. In addition to the responsibilities listed in paragraph 9-12e(4), the section contains the following personnel:

a. Materiel readiness personnel and a communications-electronics technician, to provide technical assistance, guidance, and staff supervision over the maintenance program of the brigade. This program includes routine and technical inspections of equipment used by the brigade; preparation of materiel readiness reports; promulgating policies and procedures for preventive maintenance and on-site repair; conservation and employment of equipment to provide optimum effectiveness and service; requisition and procurement of repair parts (except for those parts procured by individual units); training of maintenance personnel in preventive maintenance and repair techniques; and maintaining status records of mission essential equipment.

b. Food Service Personnel. Food service personnel are provided to plan for and manage class I supplies. The brigade food advisor exercises technical supervision over food service activities in the brigade. His primary duties include:

(1) Insuring that units are issued the rations to which they are authorized and entitled.

(2) Inspecting unit kitchens for proper handling of food, storage, preparation and service of food, maintenance of sanitary conditions, and adequacy of mess equipment.

(3) Supervising the training of mess stewards and cooks for the brigade.

9-18. Pictorial Section

The pictorial section is headed by a pictorial officer who is responsible for all photographic coverage plans for operations, intelligence, training, news, and the historical record as they relate to the field army. The section coordinates photographic coverage provided by division, corps, and army photographers as well as with higher headquarters and the Air Force. Two mobile (2 1/4-ton truck-mounted) still picture laboratories are provided to furnish onsite (black and white) laboratory service for field army headquarters and for those units located in the vicinity of army headquarters. Color film and motion picture film (both color and black and white) must be returned to the COMMZ for processing. The section consists of a pictorial officer, a photographic officer, and a photographic laboratory; projector and camera repairmen; and audio repair specialists required to perform the assigned mission. The pictorial officer serves in the dual capacity of section leader and staff pictorial officer. The section is under the operational control of brigade S3.

a. The pictorial officer serves as chief of the pictorial section and as the brigade staff pictorial officer.

b. The photographic officer provides field army headquarters with photographic service. This service includes still and motion picture coverage (except aerial combat surveillance) and still picture photographic laboratory processing for black and white film exposed by section photographers.

9-19. The Staff Judge Advocate Section

The staff judge advocate section consists of the brigade staff judge advocate, the assistant staff judge advocate, and the necessary personnel to carry out the section's mission. The section provides legal services and advice to the brigade commander and his staff and to unit commanders and personnel assigned or attached to the brigade. The staff judge advocate functions as a section leader and as a special staff officer on the staff of the brigade commander. As a staff officer, his responsibilities include:

a. Advising the brigade commander, his staff, and personnel of subordinate units on all legal matters, including military justice, military affairs, claims for or against the government, and procurement.

b. Providing legal assistance to military personnel.

c. The administration of military justice throughout the command, including trial and review of court-martial cases and maintenance of records of trial.

d. Matters relating to personnel, discipline, confinement of military prisoners, law enforcement, prisoners of war, and relations with local governments and inhabitants.

e. Training brigade personnel in military justice and other judge advocate functions.

★9-20. System Control and Operations Section

The system control and operations section operates under the supervision of the brigade S3. It is the nerve center of all brigade operations. The section consists of a headquarters, a C-E system engineering, a traffic engineering branch, a system control and operations branch, and a training and intelligence branch. The section is responsible for providing signal communications planning, engineering supervision, traffic analysis and control, signal information service, and centralized technical direction for the field army communications system.

a. The section headquarters operates as the point of contact for the brigade S3 and operating branches organic to the section. It provides the S3 with clerical and administrative support. The assistant S3 aided by chief signal NCO, works with the brigade S3 and assists him in accomplishing the tasks stated in paragraph 9-12e(3). The section headquarters is the planning and coordination element for section operation. It maintains records of all past brigade signal communications operations and training and intelligence activities. It also develops plans for future operations as directed by the S3.

b. The signal systems engineering branch conducts detailed communications system engineering studies. It develops technical plans for flexible, responsive signal communications systems. The branch operates under supervision of a communication systems engineer officer who is assisted by a staff of communications engineers (technically qualified commissioned officers) in the fields of ADP, radio, wire power engineering, and radio frequency allocation. A cryptographic technician assists in determining the types of

crypto devices for secure operation. Some of the functions performed by this branch include: determining technical circuit characteristics, equipment suitability, adaptability and compatibility with existing military and indigenous communications systems; ascertaining the capabilities and limitations of equipment and determining type installation and employment to provide quality transmission over installed circuits and systems. Operations are conducted from a vehicle mounted operations center equipped to provide the necessary facilities for branch operations. Enlisted personnel assigned to the section are technical specialists. They perform duties commensurate with their MOS. The communications systems NCO, in addition to being a qualified communicator, supervises the work performed by branch enlisted members and ensures that the operations center is properly manned.

c. The traffic engineering branch operations are supervised by a traffic engineer. The branch conducts traffic studies based on feeder reports furnished by the various command and area signal centers. Traffic summaries are analyzed in a continuing effort to relieve communication traffic congestion. This applies especially to traffic passed over the field army area system because this system supports shifting troop populations. The results of these analyses are used to make recommendation to the systems engineering branch for the addition or deletion of systems or circuits. Direct coordination is also maintained with the systems control and operations branch to keep them abreast of current and future requirements for rerouting circuits or multichannel radio and cable links throughout the systems. Traffic studies are also made to determine location of major tape relay stations within the field army area. The traffic branch determines the type and frequency of reports and monitors the reporting program. The branch chief is assisted by commissioned traffic engineering and communication center officer personnel. Enlisted personnel assigned to the branch are specialists in their respective fields. The branch operates from a vehicle-mounted operations center.

d. The systems control and operations branch includes the personnel required to direct the brigade system control, the branch chief, systems control officers, radio officers, wire officers, and operations sergeant, systems control sergeants, circuit control sergeants, a draftsman, a clerk, and

teletypewriter operators. The branch responsibilities include: allocation of circuits based on established priorities; insuring availability of circuit routes and alternate routes by coordinating centralized control of circuits; insuring efficient services by directing the subordinate battalion control section to reroute or otherwise rearrange circuits to relieve traffic congestion in the army area communication system based on information received from the systems engineering branch. The SYSCON-operations branch is responsible for the preparation and dissemination of priority lists and detailed emergency schedules to the subordinate control sections for uniform restoration of circuits in the event of disruption of communications or damage to any part of the system. It is also responsible for processing channel assignments, maintaining current availability and usage records of circuits and facilities, coordinating the maintenance of accurate current records at subordinate control installations, and maintaining technical control over operations of all subordinate systems control elements activities and functions. Branch personnel operate from a communication operation center which is connected to SYSCON of the subordinate signal battalions by radio and landline teletypewriters.

(1) The branch chief is responsible for the coordination of the activities of SYSCON with the engineer branch to insure quality, adequacy, and availability of long distance communication circuits. He also directs circuit control activities from the communication operation center and insures that this facility functions 24 hours per day.

(2) The systems control officers, radio officers, and wire officers are required to perform the day-to-day, shift-by-shift circuit and system control functions required for coordinating and directing the establishment of the field army communications system.

(3) The operations sergeant, in addition to his technical duties, assists the branch chief and other branch officers by coordinating the efforts of the enlisted technical specialists, and supervising the work of the draftsmen and clerk.

(4) The circuit control sergeants and the systems control sergeants are required to operate the communication center at the brigade SYSCON on a 24-hour basis.

(5) The draftsmen and a clerk-typist provide the clerical and drafting support to handle the workload generated by the SYSCON facility.

(6) The teletypewriter operators are required on a basis of one per 12-hour shift to handle the landline circuit control and allocation (techchannel) traffic between brigade control communications operation center of the subordinate signal battalion and other technical control facilities in the army area and command communication systems.

(7) Facilities for maintaining control over operations of the communications systems and installations established by units of the signal brigade are organic to this branch. The section uses two communications operations centers for this purpose. They contain a telephone switchboard, teletypewriter equipment, local telephone circuits and display board facilities. These facilities handle technical channels, systems control, and circuit allocation message traffic between higher headquarters and subordinate units, and provide systems control and technical control information and direction to subordinate units. Communication systems and facilities established by units assigned to the brigade are posted on the display board. This information is kept current to insure effective and reliable communication and to keep the commander advised on the signal communications situation. One operations central is located in the vicinity of the army main CP; the other is located at the alternate CP. Actual systems control is maintained by the facility located at army main with all information being furnished to the SYSCON operations central located at army alternate. This method of operation permits continuity of control during the displacement of either army main or alternate command posts. Direct contact with subordinate system control element is maintained by radio teletypewriter and over the army area system. Separate circuits used for these purposes are often referred to as engineering circuits, order wire circuits, or systems control circuits. They are of the sole-user type, used entirely for maintaining efficient and effective control over communications systems operating elements. This insures the users of the installed communications system to meet their operational need without interfering with circuits allocated for their operations. A radio teletypewriter station, a team chief and three radio teletypewriter operators are provided by the brigade communications support platoon in the SYSCON radio net at both army main and army alternate CP.

e. The training and intelligence branch supports the brigade S2, S3, and chemical officer. The branch chief is a training officer. Enlisted

personnel assigned to the section are a chief signal NCO, a chemical NCO, an intelligence NCO, a clerk, and a draftsman. The branch develops training plans and schedules, directs their implementation and monitors results through training inspections. The branch develops plans for establishing brigade level signal training facilities, prepares plans for staffing the facilities, supervises instruction and monitors training results. The subject of training is covered in detail in chapter 7. The chemical NCO and the intelligence NCO provide that support required by the S2 and chemical officer to execute their respective function as outlined in FM 101-5.

9-21. Brigade Communications Support Platoon

The brigade communications support platoon is responsible for the installation, operation, and maintenance of the communications system required to support brigade headquarters. The platoon consists of a platoon leader, a platoon sergeant, and sufficient personnel to operate the organic signal equipment. The platoon provides communications support as follows:

a. A one-position, 60-line shelter-installed, $\frac{3}{4}$ -ton truck-mounted local battery switchboard AN/MTC-7. This switchboard provides local telephone switching service for both brigade and company headquarters and for those elements of the brigade that operate in the vicinity of brigade headquarters. Necessary power is furnished by the trailer-mounted Gasoline-Engine Generator Set PU-322/G (part of the AN/MTC-7) or from some central source of power. Four telephone operators are provided to operate on a 24-hour-a-day basis. A minimum of two trunks are installed to connect the AN/MTC-7 with the switchboard located at the appropriate echelon of army headquarters (normally army main). If time and distance permit, a minimum of two trunks are installed between the brigade switchboard and the board located at an army area signal center. These trunks will be installed by the cable company of the army command signal radio and cable battalion assigned to the brigade. Three wiremen are also provided to install and maintain local circuits and telephones located in the brigade CP.

b. A small communication center, consisting of a $2\frac{1}{2}$ -ton truck-mounted shelter-installed Message Center AN/GSQ-80, a communications center specialist, and two communications clerks. This facility is operated on a 24-hour basis. Two motor messengers are provided for the internal delivery and receipt of messages in the brigade CP area and messages to and from the communications center located at both army main and an adjacent army area signal center.

c. Three radio teletypewriter (RATT) team chiefs, seven RATT operators, and three Radio Sets AN/GRC-26.

(1) A team chief and three RATT operators install and operate one of these radio teletypewriter sets to provide the army commander and his staff with mobile, secure radio communications as required.

(2) Two RATT teams, each consisting of a team chief, two RATT operators and a radio teletypewriter set. One set is associated with the systems control section (located at or in the vicinity of army main and serves as the net control station (NCS) in the SYSCON net). The other set is located at army alternate and functions as the alternate NCS in the same nets.

d. Four $\frac{1}{4}$ -ton trucks mounted with medium-power single sideband high-frequency (HF) or frequency-modulated radio sets as follows:

(1) One SSB Radio Set AN/GRC-106 and one FM Radio Set AN/VRC-46 mounted together in each of two trucks for the use of the two communication liaison officers assigned to brigade headquarters. Two radio operators are assigned to operate the SSB radio sets and to drive the vehicles.

(2) One Radio Set AN/VRC-46 mounted in each of two trucks for the use of the brigade commander and the brigade executive officer. Two chauffeurs are assigned to drive these vehicles.

e. One radio repairman is authorized the section to perform direct support level maintenance on radio equipment organic to the company.

CHAPTER 10

SIGNAL ARMY AREA BATTALION

Section I. INTRODUCTION

10-1. General

a. The signal army area battalion is a signal organization designed to implement the field army area communications system concept discussed in chapter 3. Several of these battalions are needed to support the signal communication requirements of combat support and combat service support units operating in a field army area. The field army area is located between the forward edge of the communications zone (COMMZ) and the rear boundaries of the combat division.

b. This chapter establishes doctrine and provides guidance for the tactical employment and communications-electronics operations of a signal army area battalion. The subject matter presented provides the battalion commander, his staff and the commanders of organically assigned units with a comprehensive analysis of the battalion's characteristics, organization, employment and method of operation. Material covered in this chapter also shows how the battalion functions as a vital link in establishing the army area communications system and the part it plays in the overall integrated field army communications systems.

10-2. Organically Assigned Units

a. Units assigned to the battalion that provide the means for accomplishing the battalion's mission are treated as separate entities in subsequent chapters. Unit characteristics, organization, employment and methods of operation pertaining to the battalion's command and control element are found in chapter 11, and those of the operating companies are discussed in chapter 12.

b. Illustrations used to show deployment of army area signal centers (AASC) and the arrangement of communications-electronics equipment configurations associated with the AASC are schematic in nature. They represent type arrangements and deployments of COMMEL resources authorized by current tables of organization and equipment. Type arrangements of signal communications facilities may vary at different AASC's because of certain existing local conditions. Some of the factors affecting AASC site selection and the location of COMMEL equipment at the site are the tactical situation, terrain, enemy, activity, and user requirement of units satellited on the AASC for area communications support. These factors are discussed further in chapters 11 and 12.

Section II. BATTALION CHARACTERISTICS

10-3. Mission

The mission of the signal army area battalion is to establish a segment of an army area communications system (fig. 3-2) in a designated sector of the field army. The battalion provides access to the army area communications system for units located within its area of responsibility.

10-4. Assignment and Allocation

The signal army area battalion is assigned to an army signal brigade. Normally, six of these battalions are allocated to the army signal brigade to establish an army area communications system in support of a field army (para 3-24).

10-5. Capabilities

a. The battalion establishes four army area signal center installations that form part of the army area communications system. Each center has the capability to establish long distance signal communications (multichannel radio and cable) with other centers of the battalion and with centers established by adjacent signal army area battalions. The AASC provides communication center service to units located in the vicinity of the AASC. Besides the communications center facilities, the units in the vicinity of the local communications center are provided long local trunks to the telephone and teletypewriter central

offices. Those units located at greater distances (up to 40 km) from the AASC installation are provided access trunks to the AASC.

b. Other battalion capabilities include operating an area motor messenger service as part of the area signal system; establishing a battalion level communications system control and signal information service; providing organic (AASC's with a displacement capability or with limited augmentations of COMMEL resources; and providing tape relay facilities at designated AASC's as required.

c. The battalions electronics equipment maintenance capability consists of providing direct support (DS) level maintenance for organic COMMEL equipment.

10-6. Limitations

a. The battalion depends upon combat service support units for repair parts supply, maintenance support exceeding the capabilities or capacity of the battalion, medical support, finance support, dental support, and supplemental motor transportation. At area signal centers where data traffic is processed, TOE 11-500 TE (Digital Data Transmission) teams will be required to install, operate, and maintain the ancillary (transceiver) ADP equipment.

b. When demands for signal cable communications exceed the cable installation and recovery capabilities of the battalion, cable construction augmentation must be secured from resources available to the Army signal brigade.

c. The battalion also depends upon the Air Force for tactical airlift support (FM 100-27).

10-7. Training Mobility and Unit Category

Assigned personnel, in addition to training in their basic skills, receive further training under Army Training Program (ATP) 11-85 to operate as an effective unit. All personnel except the chaplain, are trained to engage in effective, coordinated defense of the unit's area or installation. This includes, but is not limited to, rear area protection procedures, operations in an internal defense environment, and operations under CBR conditions. For further information concerning training, refer to chapter 6. The ground mobility as expressed in appendix I, AR 310-31, of each unit assigned to the battalion is stated separately in chapter 11 for the headquarters and headquarters company and in chapter 12 for the signal army area company. The battalion is designated a category II unit as referred to in AR 310-25 (unit categories).

Section III. ORGANIZATION AND EMPLOYMENT

10-8. Introduction

The signal army area battalion organized under TOE 11-85G is a fixed type signal battalion. It consists of a specific number of units organically assigned to the battalion that operate together to carry out the assigned mission of the battalion.

10-9. Organization

The organization chart, figure 10-1, shows an allocation of one headquarters and headquarters company and four identical signal army area companies per signal army area battalion. The HHC is organized under TOE 11-86G and operates as the command and control element of the battalion. This company provides the field army area motor messenger service for designated units and installations in the battalion sector of responsibility. It also provides the limited displacement capability for army area signal centers established by the battalion, the battalion tape relay capability and aviation capability. The four army area signal companies, each organized under TOE 11-87, are the operating elements of

the battalion. This unit grouping, TOE 11-85G, operates as a single entity to accomplish the battalion mission as stated in paragraph 10-3. A recapitulation of major items of communications electronics equipment that support the battalion's mission are also found in TOE 11-85G.

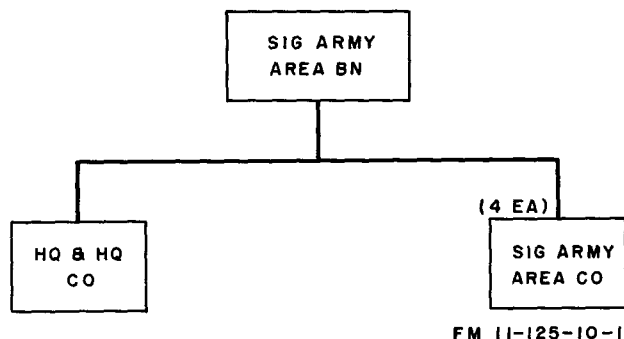


Figure 10-1. Organization chart, signal army area battalion.

10-10. Employment

The signal army area battalion normally is employed as a major subordinate element of an

army signal brigade. It operates under direction furnished by the brigade and in conjunction with identical, coequal battalions to establish the field army area communications system.

CHAPTER 11

HEADQUARTERS AND HEADQUARTERS COMPANY

SIGNAL ARMY AREA BATTALION

Section I. UNIT CHARACTERISTICS

11-1. Introduction

The headquarters and headquarters company (TOE 11-86) is a command and control element. It normally is employed in one echelon and is located near one of the army area signal centers. The company has the capability of providing continuous operational supervision by echelonment of the operations and intelligence section.

11-2. Mission

The mission of the headquarters and headquarters company is to:

- a. Direct and coordinate operations and training of the battalion, and to provide the headquarters facilities with which the battalion commander exercises control.
- b. Provide supplemental supply, motor, and COMMEI maintenance for the battalion.
- c. Provide a system control and signal information service for the battalion portion of the army area communications system.
- d. Provide motor messenger service between the signal centers operated by the battalion.
- e. Provide personnel and equipment to establish radio relay repeater stations in the main trunks of the area system installed and operated by the battalion.
- f. Provide a signal center displacement capability and a limited augmentation of multichannel radio and wire equipment and personnel for the area centers.

11-3. Assignment and Allocation

a. *Assignment.* The headquarters and headquarters company is organic to the signal army area battalion, TOE 11-85.

b. *Allocation.* The headquarters and headquarters company is allocated on the basis of one each to a signal army area battalion, TOE 11-85.

11-4. Capabilities

a *Full Strength (Level 1).* At full strength, the headquarters and headquarters company is approximately 90 percent mobile and is capable of providing:

- (1) Command and control, staff planning, and supervision of the operations and training of the battalion.
- (2) Religious services for the battalion.
- (3) Administrative and logistic support for a signal army area battalion to include:
 - (a) Consolidated crypto maintenance for the battalion.
 - (b) Electronic, generator, and motor maintenance to supplement operating companies' capabilities.
 - (4) Provides a system control and information service to:
 - (a) Perform system engineering and traffic analysis and control of the battalion portion of the area signal system.
 - (b) Coordinate the battalion portion of the area signal messenger service.
 - (c) Operate a battalion signal information service.
 - (5) Provides a motor messenger and distribution service for pickup and delivery of pouched distribution among signal centers of the battalion and laterally to adjacent battalion distribution centers.
 - (6) Provides personnel and equipment to establish radio relay repeater stations in the main trunks of the area signal system and in extension facilities installed and operated by the battalion.
 - (7) Provides a communications center displacement capability and a limited augmentation of multichannel radio and wire equipment and personnel to support the area signal centers of the battalion.

b. Reduced Strength. Reduced strength levels 2 and 3 adapt the table of organization and equipment for reduced operational capabilities in digressive 10 percent increments, from approximately 90 percent for level 2 and 80 percent for level 3. Levels 1 through 3 are designed to relate to the categories established by AR 220-1 and AR 135-8.

11-5. Limitations

This unit depends on designated combat service

support units for medical, dental, and finance services, supplemental transportation, direct support maintenance for nonsignal items of equipment and supplemental direct support maintenance for communications-electronics equipment.

11-6. Category

This unit is designated a category II unit (AR 310-25).

Section II. ORGANIZATION AND EMPLOYMENT

11-7. Introduction

The headquarters and headquarters company (fig. 11-1) has the function of providing command and coordination of the overall activities of the battalion to include administrative and logistical support for the units organic to the battalion, systems control and information service, and an internal communications system (fig. 11-2).

11-8. Organization

The headquarters and headquarters company is organized as shown in figure 1-1. The organization has the following elements:

- a.* Battalion headquarters.
- b.* Headquarters company.
 - (1) Company headquarters.
 - (2) Administration and logistics section.
 - (3) Operations and intelligence section.
 - (4) Battalion motor maintenance section.
 - (5) Battalion electronics maintenance section.
 - (6) Signal operations platoon.
 - (7) Messenger and distribution section.

11-9. Employment

The headquarters and headquarters company is normally employed in one echelon, and battalion headquarters and headquarters company is collocated near one of the army area signal centers.

11-10. Battalion Headquarters

Battalion headquarters contains the battalion commander and his staff that controls and supervises the operations of the companies assigned to the signal battalion. The assisting staff and staff facilities are provided by the administrative and logistics section, the operations and intelligence section, and the battalion personnel section.

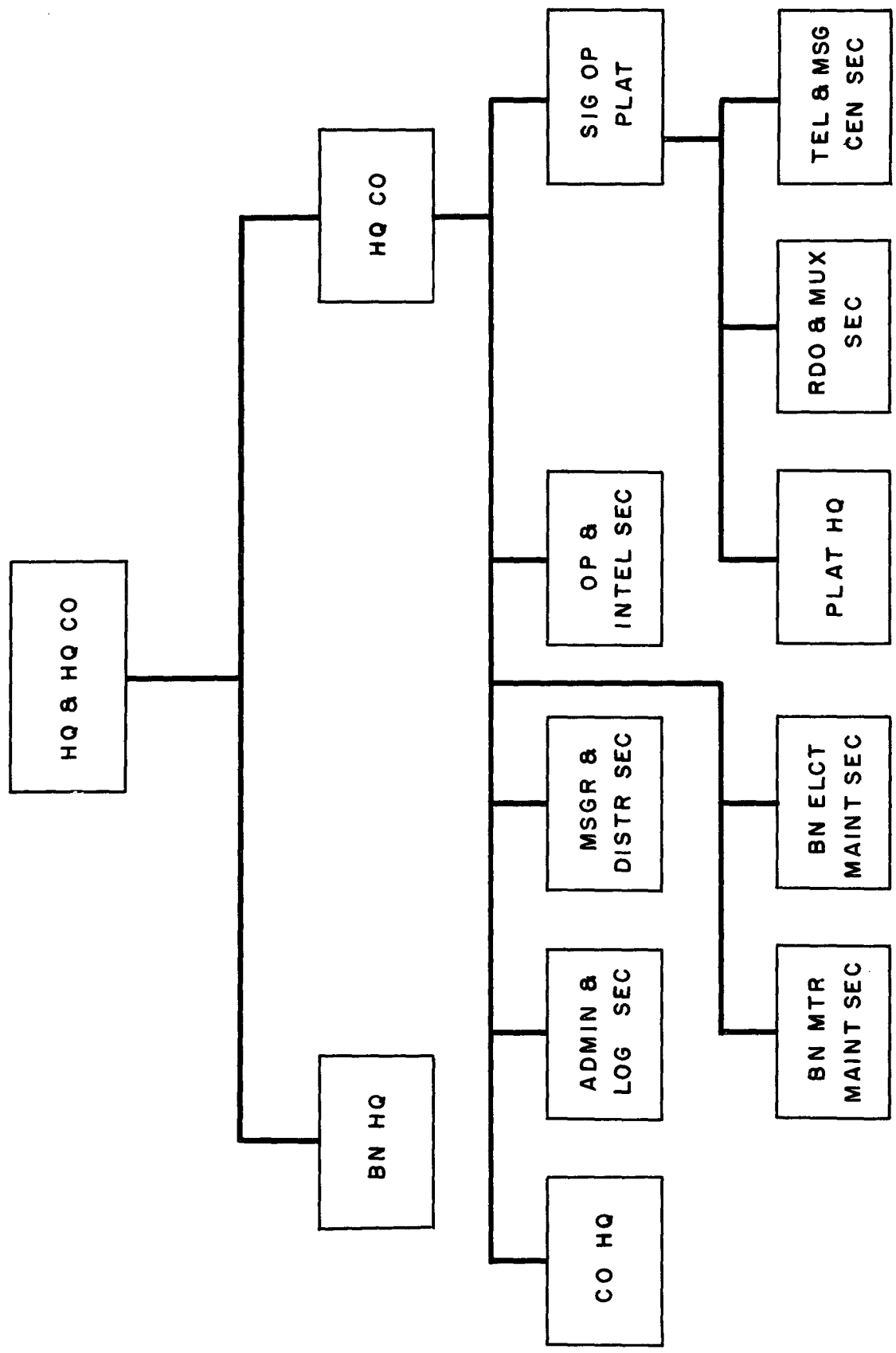
11-11. Headquarters Company

a. Company headquarters provides the mess facilities and supply support for headquarters and headquarters company. It also provides an internal signal system (fig. 11-2) for headquarters and headquarters company. The trunk circuits from this system to an army area signal center switchboard are installed by the signal army area company operating that signal center. The headquarters company mess will normally be combined with the mess facilities of the signal army area company near which it is located.

b. The administrative and logistics section provides the enlisted personnel and equipment to support the battalion executive officer, adjutant/S1, and the battalion S4 in performing the administrative functions of the battalion. The section requisitions, accounts for, and performs limited distribution of supplies for the battalion.

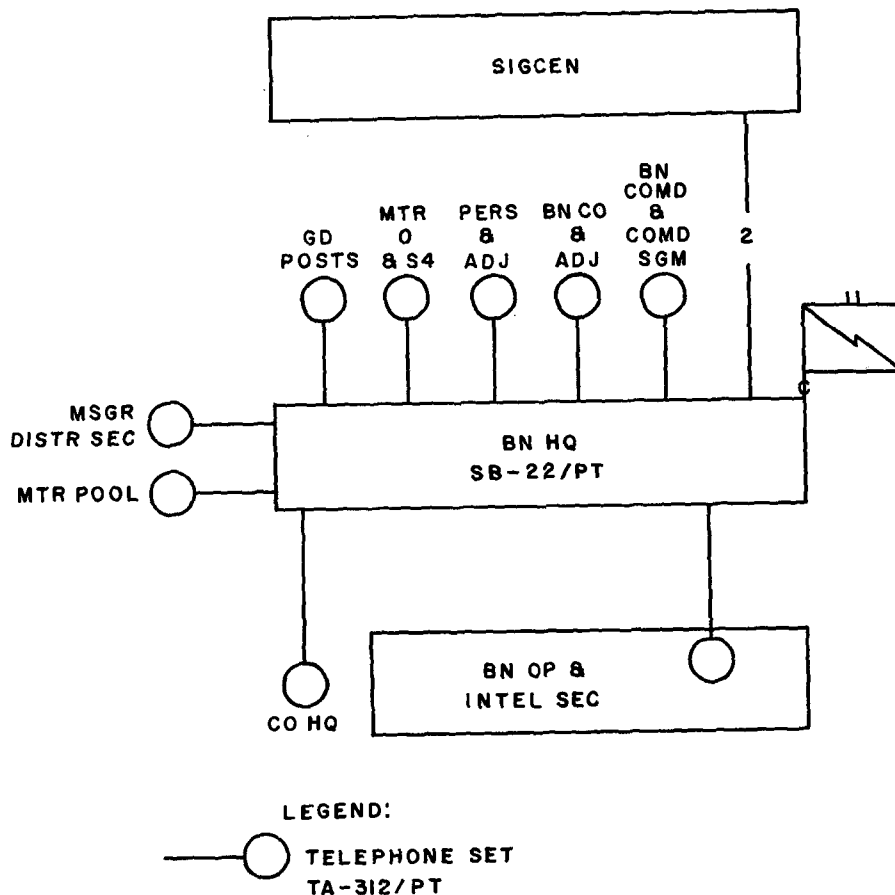
c. The operations and intelligence section provides the enlisted personnel and the equipment with which the battalion S3 supervises the operations, training, and intelligence missions of the battalion. The section operates a system control and signal information service (fig. 11-3). This service, which is a part of the army signal brigade information system, collects, records, and disseminates the latest information on the location of units served by the area signal system and transmits telephone and telegraph routing instructions to those units. To perform its mission properly, the section requires direct telephone and teletypewriter circuits to the signal center platoons of the signal army area companies and to the system control and operations section of the army signal brigade. To facilitate termination and operation of these circuits, a mobile van is provided.

- (1) The section, under the supervision of



FM 11-125-11-1

Figure 11-1. Organization of headquarters and headquarters company, TOE 11-86G.



FM 11-125-11-2

Figure 11-2. Internal wire net, HHC, TOE 11-86G.

the battalion S3, plans, controls, and supervises the radio, radio relay, and wire operations of the battalion. This includes the determination of radio relay sites, the engineering of cable routes, the installation and operation of carrier equipment, and circuit control, patching and traffic analyses.

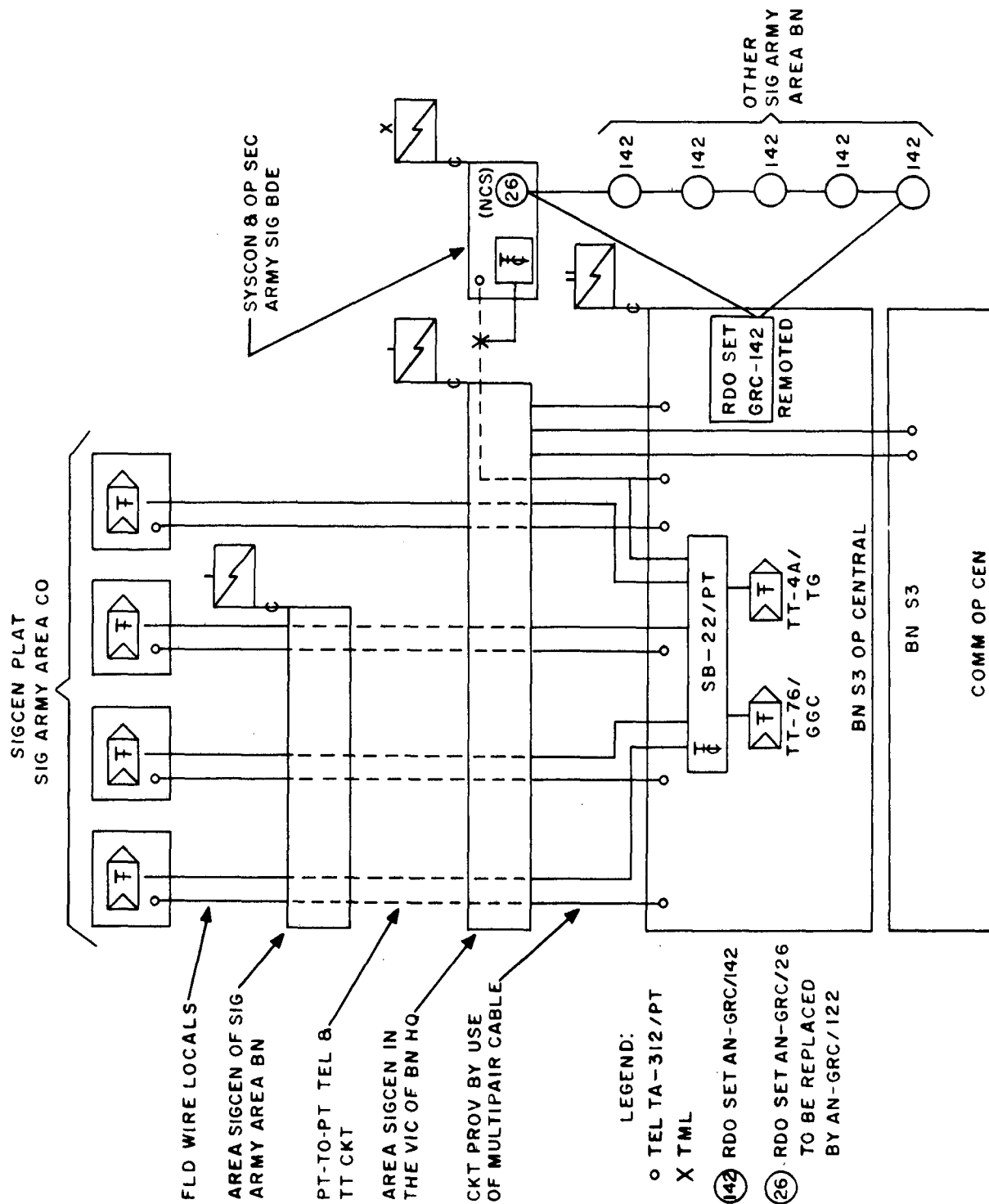
(2) The section prepares a signal intelligence plan that includes the procedures to be followed in locating and reporting enemy jamming or electronic warfare activities, and the methods to be used in counteracting these activities. The section also screens periodic intelligence reports and special signal intelligence reports, and disseminates pertinent information to the signal army area companies.

(3) The section provides staff supervision of the battalion messenger and distribution section and coordinates its activities with the army signal brigade.

(4) The section provides staff supervision of the aviation element consisting of one helicopter and aviation personnel.

d. The battalion motor maintenance section operates under the supervision of the battalion motor officer. It provides organizational motor maintenance and power generator maintenance for headquarters and headquarters company and supplemental motor maintenance support for the signal army area companies. The section operates a tank truck to haul diesel fuel and gasoline from class III distribution points to the operating companies of the battalion. It also operates a wrecker to recover headquarters and headquarters company vehicles and to supplement vehicle recovery operations in the signal army area companies. The wrecker is also used to place power units on and remove them from trailers and to handle skid-mounted equipment.

e. The battalion electronic maintenance section



FM 11-125-11-3.1

Figure 11-3. System control facilities, signal army area battalion.

operates under the supervision of the battalion S4. It performs direct support level electronic maintenance on equipment organic to headquarters and headquarters company and provides direct support level maintenance support for the signal army area companies organic cryptographic equipment. This section is authorized two electronic shop shelters for its maintenance activities.

f. The messenger and distribution section establishes a pickup and delivery point for pouches or bags of messenger traffic and operates a scheduled messenger service that is part of the overall field army area messenger communications system. The section normally operates in close proximity to the message center facility of the signal army area company which is collocated with the parent battalion headquarters.

(1) The message distribution point should not be confused with the adjutant general (AG) message distribution section that duplicates and distributes messages to staff sections within a large headquarters. The messenger and distribution point discussed here is established and operated by the battalion messenger and distribution section to serve as a coordinating center for the receipt, dispatch, reroute, and delivery of bags or pouches of tactical message traffic destined for, or received from any of the four army area signal centers established by the battalion. It also serves as a message distribution point for messages to and from adjacent army area signal battalion. Types of messenger traffic include, but are not limited to, overlays, maps, diagrams, voluminous reports, directives, publications and photographs having an impact on tactical operations.

(2) The section also operates a scheduled motor messenger service between the battalion distribution point and the message center facility of each army area signal center established by the battalion. It also operates a scheduled motor messenger service between the battalion distribution point and the distribution point of adjacent signal army area battalion. In addition, it provides direct messenger service between certain designated supported headquarters and/or units, and the army area signal center on which satellited. This latter service is available (within the resources of the section) only when the supported unit or headquarters has no organic messenger capability. The ACSC-E will designate the units entitled to this support. Units having messenger capabilities make pickup and delivery

of message traffic at the message center facility of the army area signal center on which they are satellited.

(3) In messenger operations between AASC installations of the same parent battalion, each message center segregates and pouches outgoing messenger traffic for each area signal center in the battalion. Each pouch is then delivered by messenger to the parent battalion distribution point for rerouting to the designated area signal center. Pouched messenger traffic between area signal centers of the same battalion may be delivered directly to expedite service.

(4) In messenger operations between adjacent army area signal battalions, each message center segregates and pouches outgoing traffic according to distribution point designations. In other words, message traffic for all area centers served by a given distribution point is placed in one or more pouches for delivery by messenger to the distribution point of the parent battalion. The bags or pouches are then relayed to the distribution point of the adjacent battalion. This procedure is repeated until they reach the designated distribution point. At the designated distribution point, pouches or bags are opened, contents are segregated for each army area signal center served, and final delivery is made to the message center facility of the respective army area signal center.

Figure 11-4. Type army area signal messenger service.

Located in back of manual.

g. The signal operations platoon (fig. 11-5) provides the personnel and equipment to establish radio relay repeater stations in the main trunks of the area communication system. When required, it is capable of assuming the functions of an area signal center that may have been ordered to displace or which has been destroyed by enemy action. The platoon may also be used to support an area signal center when communications requirements of that signal center exceed the organic capabilities of the company operating the center.

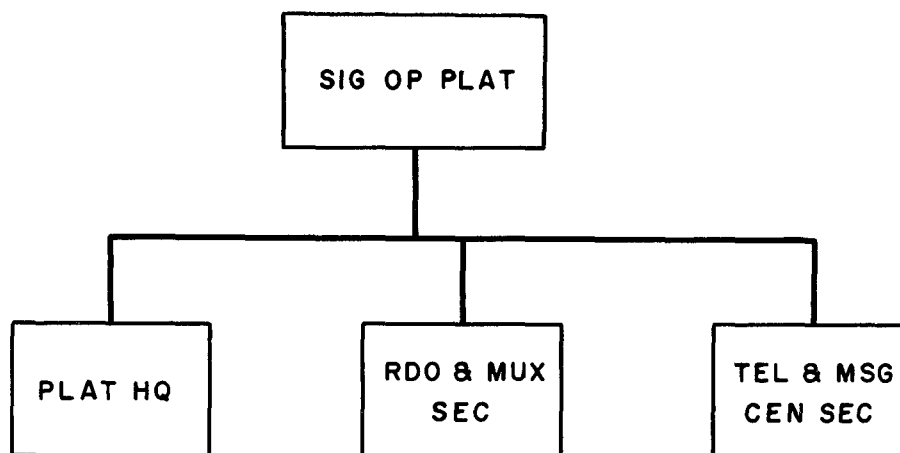
(1) Platoon headquarters provides command and control and coordination at platoon operations.

(2) The radio and mux section establishes and operates radio relay repeater stations in the main trunks of the army area communications system and in the extension facilities, when required. The section also operates radio relay ter-

minal equipment when the platoon takes over the operations of a signal center.

(3) The telephone and message center sec-

tion provides and operates telephone and teletypewriter central offices. The section also provides message center service.



FM 11-125-11-5

Figure 11-5. Signal operations platoon.

CHAPTER 12

SIGNAL ARMY AREA COMPANY

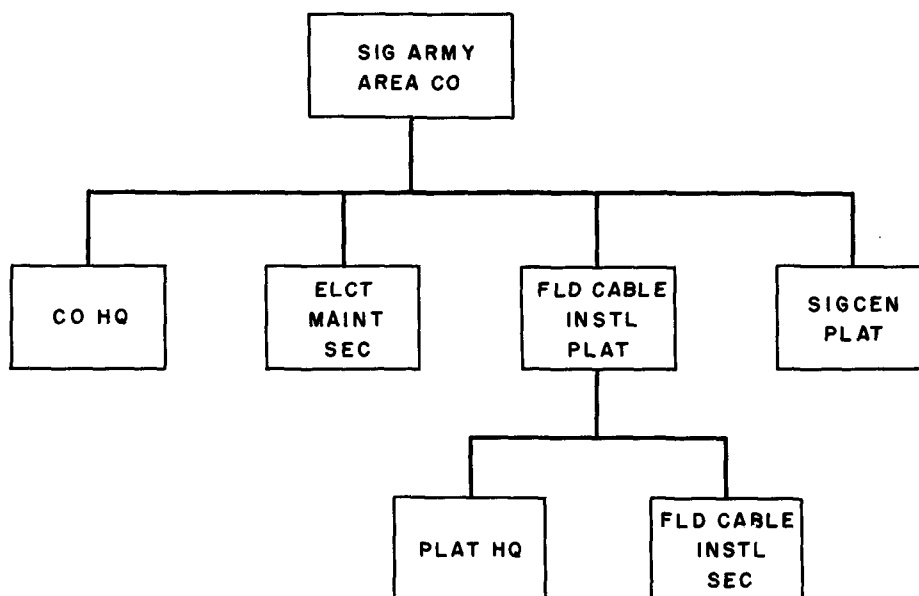
Section I. UNIT CHARACTERISTICS

12-1. General

a. Each signal army area company (fig. 12-1) installs, operates, and maintains one area signal center in the army area communications system. The company also provides physical security for the signal center. The signal army area companies are the basic building blocks to establish a field army area communications system. They provide signal communications support at designated

locations within the army and corps areas. Normally, 18 to 24 of these units are deployed throughout the field army area between the army rear boundary and the rear boundaries of the combat divisions. They are located to provide easy access and to best serve the needs of the majority of users.

b. The communications complex installed, operated, and maintained by each army area signal



FM 11-125-12-1

Figure 12-1. Signal army area company.

company is interconnected with communications facilities established by the other army area signal companies. This is accomplished through the medium of multichannel radio and cable links. For control purposes, four army area signal companies are grouped together with a headquarters and headquarters company, (TOE 11-86) and operate as an organic battalion. The battalion, (TOE 11-85) is then responsible for that segment of the army area communications system installed, operated, and maintained by its subordinate units.

c. There are instances where some signal army area company facilities are connected directly with command communications system facilities of field army and corps headquarters (fig. 3-2). These facilities are also connected to the communications systems established by the headquarters of divisions assigned to the corps of the field army. In some cases, AASC facilities are integrated with theater army communications systems facilities established by U.S. Army Strategic Communications Command (theater).

12-2. Mission

The mission of the signal army area company is to install, operate, and maintain one area signal center of the army area communications system. The type and description of the signal center communications furnished will be discussed in the organizational breakdown of the company.

12-3. Assignment and Allocation

a. *Assignment.* The signal army area company is organic to the signal army area battalion, TOE 11-85.

b. *Allocation.* Four signal army area companies are allocated to a signal army area battalion, TOE 11-85.

12-4. Capabilities

a. At level 1 (full strength), this unit:

(1) Installs, operates, and maintains one army area signal center as part of the field army area communications system.

(2) Installs and maintains spiral-four trunk cable links to adjacent army area signal centers.

(3) Installs and operates the multichannel equipment which provides the trunk circuits to adjacent area signal centers.

(4) Provides multichannel radio relay and/or cable extension links to user units and field wire locals, as required.

(5) Provides telephone and teletypewriter patching and switching facilities.

(6) Provides terminal teletypewriter, message center, and cryptographic service for units served by the center.

(7) Operates a radio wire integration facility.

(8) Provides direct support level maintenance of organic signal equipment.

b. When the unit is at TOE strength levels 2 and 3 (AR 220-1 and AR 135-8), operational capabilities are reduced to 90 and 80 percent, respectively, of the level 1 capability.

c. This unit depends upon other units in the area for medical and dental services.

12-5. Training and Unit Category

Individuals of this organization can engage in effective, coordinated defense of the unit's area or installation. This includes, but is not limited to, rear area damage protection procedures, internal defense and internal development operations, and operations under chemical, biological, radiological, and nuclear conditions. The company is designated a category II unit as referred to in AR 310-25 (unit categories).

Section II. ORGANIZATION AND EMPLOYMENT

12-6. Introduction

The signal army area company (fig. 12-1) is organized under TOE 11-87 and is organically assigned to the signal army area battalion, TOE 11-85. It installs, operates, and maintains an area communication complex consisting of a communications center, long distance electronic transmission and receiving facilities, and extension systems (access or tributary trunks) for direct access to the army area long distance communications system.

12-7. Organization

The signal army area company (fig. 12-1) consists of a company headquarters, an electronic maintenance section, and two operating platoons. The platoons are organized according to functional areas. The operating sections within each platoon are organized to perform specific tasks and functions within the overall functional area of the platoon.

a. The company headquarters is organized to provide the unit's command element and other

elements to support the operations, training, administrative, and logistics functions of the company. The signal maintenance section is organized into mobile repair teams to provide communications-electronics maintenance support at the operations sites of the AASC installation.

b. Each platoon headquarters is organized to provide command and control for sections organic to it.

Section III. METHOD OF OPERATION

12-9. General

The signal army area company (fig. 12-1) provides signal facilities for direct and general support of units and unit elements located in an area signal center zone of responsibility. The area signal center, including the radio relay system and associated carrier equipment, is a part of the army area signal system. The signal center provides a point of entry into the army area signal system for users, including army and corps headquarters, and switching and patching points for channels of the army area communications system.

a. Requirements for multichannel extension links originating at the army area signal center are referred to the battalion S3 for coordination with the system control officer of the army signal brigade. The amount and type of equipment required for units within a signal army area company's zone of responsibility will be variable and dependent upon the number of units in the area and their missions. The company is capable of installing, operating and maintaining a maximum of 12 multichannel signal systems. This includes those systems committed to providing trunks to at least two adjacent army area signal centers in the army area communications system. The company will also provide extension links for major supported units. Smaller organizations will be tied into the switchboards of the major supported units or directly to the area signal center patching panel, depending on their location.

b. Signal information generated at the area signal center is sent to the signal information section of the area signal battalion for collation and transmission to the systems control and operations section of the army signal brigade.

c. The radio teletypewriter sets authorized each signal army area company are netted with each other to provide a backup for systems control communications. The radio station provided

12-8. Employment

The signal army area company is employed as a subordinate unit of a signal army area battalion. The unit is employed at a location having a large number of troop units and/or headquarters that have requirements for signal communications support.

by the signal army area company operating the signal center where battalion headquarters is collocated is normally designated as the battalion net control station. This station will also function as a secondary station in the signal brigade systems control net.

d. Frequencies and call signs for the radio wire integration station operated by the army area signal company are designated by the field army signal officer and are listed in the army signal operations instructions.

e. The signal center location, circuit requirements, radio relay frequency assignments, and motor messenger schedules are designated by the system control and operations section of the army signal brigade through the battalion S3.

12-10. Company Headquarters

Company headquarters provides command and administrative supervision. It also provides mess facilities for company personnel and motor maintenance for vehicles.

a. Administrative and logistical reports will be brief and informal, and will be consolidated and forwarded to the battalion administrative and logistics section for final preparation and submission to higher headquarters.

b. Supply (class I, II, and VII) will be handled administratively by company headquarters. Class III supplies (POL) for the company will be delivered by the tank truck of the battalion motor maintenance section. Other classes of supply as defined in JCS publications will be handled through normal supply channels.

c. The mess personnel of company headquarters usually will provide mess facilities only for company personnel. However, if headquarters and headquarters company is located near a signal army area company, the two companies will combine their messes and operate on a consolidated basis.

d. The motor maintenance element of company headquarters dispatches and provides maintenance for company vehicles. It also institutes and supervises a training program for company drivers.

12-11. Electronic Maintenance Section

The electronic maintenance section perform on-site maintenance on the COMMEL equipment authorized to the company. The section is authorized two truck-mounted electronic maintenance shelters to perform its maintenance mission.

12-12. Field Cable Installation Platoon

The field cable installation platoon (fig. 12-1) consists of a platoon leader, a platoon sergeant, and ten 5-man field cable construction teams. The platoon installs and maintains the internal wiring and cabling of the signal center; the spiral-four cable links of the army area communications system; and the field cable and wire extension links to units supported by the signal center. In addition, the platoon installs field cable and wire between the radio relay and carrier terminals in the signal center. Work orders for the installation of area trunk and extension links are issued by the battalion S3.

12-13. Signal Center Platoon

The signal center platoon (fig. 12-1) installs and operates the signal equipment at an area signal center (fig. 12-2). It also provides and operates radio relay and wire carrier terminals at the command posts of the units served by the multi-channel extensions. Equipment is packaged to facilitate the remoting of radio relay sets to obtain better siting and to separate message center facilities from the main equipment complex, when desirable.

Figure 12-2. Type signal equipment facilities employed at area signal center.

Located in back of manual.

a. Platoon headquarters provides command and control of, and coordinates, platoon operations, and performs organizational maintenance on all power units of the company. The platoon leader serves as company operations officer. In this capacity, he plans the layout of signal equipment within the signal center and supervises its installation and operation. The platoon leader and his assistants are responsible for the system control and signal information service mission of the company. Platoon headquarters operates a tele-

graph terminal, part of the operations central, in the battalion system control and signal information service. Trunks must be made available between signal centers in order to provide the speech plus half-duplex circuits required for communication and technical control purposes.

b. The radio relay terminal section installs and operates the radio relay terminal equipment within the signal center. Sufficient single and double 12-channel radio relay and carrier terminal equipment (provided by the wire carrier and repeater section) are available in the company to terminate systems which originate in adjacent area signal centers. In addition, equipment and personnel are provided to install extension facilities to users in the vicinity of the signal center.

c. The wire carrier and repeater section installs and operates the wire carrier and repeater equipment organic to the company. The section operates 10 double 12-channel carrier systems and two 12-channel carrier repeater stations.

d. The radio section operates a radio wire integration station at the area signal center to connect mobile FM radio stations into the army area communications system on a push-to-talk basis. The system of integration is used to establish signal communications between mobile FM radio stations and telephone subscribers connected to the area. Only those units listed in the army standing signal instructions (SSI) will be permitted access to the system. Lists of frequencies for use in the integration system are published in the army SOI. The radio section also operates a mobile radio teletypewriter set as a backup for the battalion speech/teletypewriter system control and information service net.

e. The message center section is the contact point of message handling and distribution within the area signal center. It accepts and processes messages for transmissions and delivery. The section will maintain only those registers, logs, and files necessary to insure message accountability of traffic processed through the communications facility. Permanent copies and records of incoming and outgoing messages are not maintained by the message center section. Supported units will file traffic directly with the message center and pick up their incoming messages and distribution. This arrangement will require careful planning and coordination with the units served by the area signal center. Section operations are performed by a message subsection and a cryptographic and teletypewriter subsection.

(1) Message center operations are conducted in a message center operations shelter. It is the responsibility of the subsection to—

(a) Review outgoing messages and record them in the proper registers.

(b) Assure that proper classification and precedence are indicated on the messages and to process them accordingly.

(c) Select the means of transmission, to include the routing, and prepare the procedure heading for the means selected.

(d) Place outgoing material in properly designated pouches to be picked up by messengers from the battalion messenger and distribution section.

(e) Break down incoming pouched material and notify units to pick up same.

(f) Maintain records and files relative to the processing of message traffic.

(2) Cryptographic and teletypewriter operations are conducted in the telegraph terminal ve-

hicle (AN/TSC-58). The subsection is authorized on-line (TSEC/KW-7) cipher machines. It is the responsibility of the subsection to—

(a) Store cryptographic materials used by the section.

(b) Use appropriate cryptographic systems in the encryption of classified outgoing messages.

(c) Decrypt, process, indorse, and edit incoming encrypted messages.

(d) Check for security violations.

(e) Maintain cryptographic files.

(f) Dispose of classified waste in the prescribed manner.

f. The wire operations section installs and operates an SB-675/MSC communication patching panel, an AN/MTC-1A telephone central office, and an AN/MGG-9 teletypewriter central office. The section also performs the technical control function at the area signal center. All signal equipment operated at the area signal center is connected by field cable to the patching panel.

CHAPTER 13

ARMY COMMAND SIGNAL RADIO AND CABLE BATTALION

Section I. BATTALION CHARACTERISTICS

13-1. Introduction

The army command signal radio and cable battalion, TOE 11-75G, in conjunction with the army command signal operations battalion, TOE 11-95G, installs, operates, maintains, and controls the army command communications system (fig. 3-1). The army command signal radio and cable battalion provides long distance command communications facilities (multichannel radio, cable, and single channel HF radio) to a fragmented field army headquarters. The army command signal operations battalion provides the terminal communications facilities at the command signal centers of the fragmented field army headquarters.

13-2. Mission

The army command signal radio and cable battalion provides long distance command communications facilities (multichannel radio, cable, and single channel HF radio) to a fragmented field army headquarters. These facilities include the links between the echelons of the field army headquarters and its major subordinate headquarters (fig. 3-1 and 3-7).

13-3. Assignment and Allocation

a. Assignment. The army command signal radio and cable battalion is assigned to an army signal brigade.

b. Allocation. The army command signal radio and cable battalion is assigned to an army signal brigade.

13-4. Capabilities

Note. When the terms *24-channel system* or *12-channel system* appear in the following paragraph, they refer to the number of voice-frequency channels provided between headquarters or installations; they do not refer to the equipment that produces these channels.

When the army command signal radio and cable battalion is at TOE strength level 1 (AR 220-1

and AR 135-8), it is approximately 80 percent mobile and is capable of the following:

a. Install, operate, and maintain the army command multichannel radio systems indicated in (1) through (3) below (fig. 3-1).

(1) One 24-channel system between army main and army alternate.

(2) Six 24-channel systems from army main and army alternate as follows:

(*a*) One 24-channel system (with repeater capability) between army main and each corps main (3 corps).

(*b*) One 24-channel system (with repeater capability) between army alternate and each corps alternate (3 corps).

(3) Eighteen 12-channel systems (with a 50 percent repeater capability) from army main and army alternate as follows:

(*a*) One 12-channel system from army main to army rear.

(*b*) One 12-channel system from army alternate to army rear.

(*c*) One 12-channel system from army main to field army support command (FASCOM) main.

(*d*) One 12-channel system from army alternate to FASCOM alternate.

(*e*) Seven 12-channel systems between army main and seven major subordinate army unit headquarters.

(*f*) Seven 12-channel systems between alternate and seven major subordinate army unit headquarters.

b. Install, operate, and maintain the army command radio teletypewriter communications facilities indicated in (1) through (5) below (fig. 3-7).

(1) Twelve radio teletypewriter stations, six at army main and six at army alternate, for operation in the army command nets.

(2) Sixteen individual mobile subordinate radio teletypewriter stations located at army rear, FASCOM, and headquarters of major subordinate army units for operation in army command nets.

(3) Eight radio teletypewriter stations for operation in the four army air request nets (four stations located at army main and four located at army alternate).

(4) Two radio teletypewriter stations for operation in the army signal brigade command and control net (SYSCON): one in support of the army command signal radio and cable battalion headquarters and the other in support of the army command signal operations battalion headquarters.

(5) Four stations in the army-adjacent army liaison net. (These stations are located as follows: army main, army alternate, adjacent army main, and adjacent army alternate.)

c. Install, operate, and maintain a radio wire integration (RWI) facility at both army main and army alternate.

d. Perform organizational maintenance on organic weapons, aircraft, motor vehicles, power generators, avionics, and communications-electronics equipment.

e. Perform direct support (DS) level maintenance on organic communications-electronics and cryptographic equipment.

f. Provide aircraft for resupply and evacuation of critical communications items employed

at the battalion's multichannel radio sites and other isolated communications installations.

g. Provide transportation by aircraft and motor vehicles for direct support level signal maintenance personnel and equipment organic to the battalion.

h. Provide aerial reconnaissance for wire and cable routes.

i. Install, operate, and maintain field cable communications systems to support the multichannel radio systems installed by the battalion.

j. Install and maintain selected field wire and cable circuits between army main and army alternate and from army main and army alternate to major subordinate headquarters and to army units adjacent to army headquarters as required.

k. Rehabilitate indigenous cable and open wire lines in the battalion area of responsibility.

l. Engage in effective, coordinated defense of the unit area or installation.

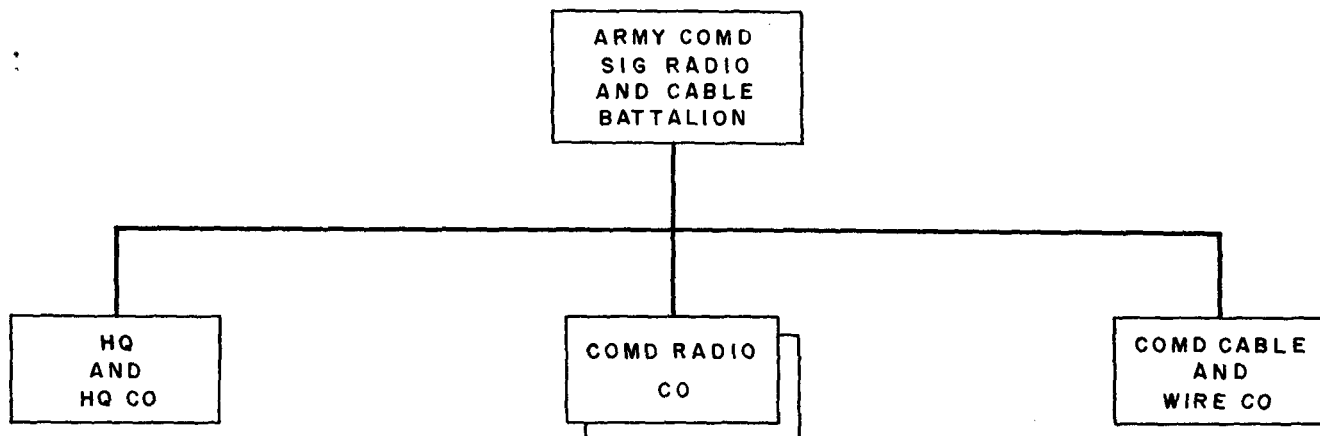
13-5. Limitations

The army command signal radio and cable battalion has the following limitations.

a. When the battalion is at TOE strength levels 2 and 3 (AR 220-1 and AR 135-8), operational capabilities are reduced to 90 percent and 80 percent respectively, of the level capability.

b. The battalion is dependent upon:

(1) The headquarters and headquarters company of the army signal brigade for com-



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Figure 13-1. Organization of army command signal radio and cable battalion.

munications system control, circuit allocations and priorities, and allocation of frequencies.

(2) Combat service support organizations and the Air Force as follows:

(a) Combat service support organizations in its area for supply and maintenance support, medical and finance service and for transportation as required.

(b) Air Force for tactical airlift support.

(3) Appropriate TOE 29-500 teams for additional aircraft when it is operating in Southeast Asia or in a similar environment.

(4) Signal communications teams from TOE 11-500 when required to support army

ground liaison officer teams (GLO), and/or when additional army air request capabilities are required.

(5) FASCOM units for required additional direct support maintenance and general support maintenance.

13-6. Category

This unit is designated a category II unit. (Reference unit categories, AR 310-25.

13-7. Mobility

For mobility of units organic to this battalion, see chapters 14, 15, and 16.

Section II. ORGANIZATION AND EMPLOYMENT

13-8. Introduction

The army command signal radio and cable battalion is organized and employed as described in paragraphs 13-9 and 13-10. The organization and employment of the units comprising the battalion are described in chapters 14 through 16 of this manual.

13-9. Organization

The army command signal radio and cable battalion (fig. 13-1) is organized under TOE 11-75. It is a category II unit (AR 310-25) and is assigned to an army signal brigade. The battalion includes:

a. A headquarters and headquarters company (TOE 11-76).

b. Two command radio companies (TOE 11-77).

c. A command cable and wire company (TOE 11-78).

13-10. Employment

a. One army command signal radio and cable battalion is assigned to the army signal brigade. Elements of the battalion may be attached to headquarters of designated subordinate units or other field army installations, headquarters or activities that require communications support within the capabilities of the battalion.

b. Prior to moving into the field army area to establish communications and prior to subsequent moves, the commander of the army command signal radio and cable battalion will be briefed by the army ACSC-E and his staff and will be provided with orders or directives outlining the communications requirements needed to support operational demands.

Section III. CONCEPT OF OPERATION

13-11. Introduction

a. The army command communications system is installed, operated, and maintained by two battalions: the army command signal operations battalion and the army command signal radio and cable battalion. The army command signal operations battalion provides the terminal type communications facilities (message center, motor messenger, cryptographic, facsimile, telephone, and teletypewriter) and the army command signal radio and cable battalion provides the multichannel radio, HF radio, and associated cable links required by the main, alternate, and

rear command posts of a field army headquarters. The radio and cable battalion also provides long local wire and cable circuits as required between the communications facilities of the army command signal operations battalion and units in the vicinity of echelons of the army headquarters.

b. Army alternate is located at a suitable distance from army main to prevent destruction of both by a single nuclear strike. Sufficient personnel and equipment are provided so that army alternate communications may duplicate army main communications. The communication links

are so installed that if either army main or army alternate is destroyed by enemy action, continuity of communications will be maintained.

c. The concept of operations presented in this manual is a type concept of operations. The operations of the army command signal radio and cable battalion can be tailored to fit the requirements of the situation. Whatever concept of operations is adopted, detailed battalion and company standing operating procedures (SOP) must be developed to standardize routine communications functions.

13-12. Battalion Type Deployment

The battalion headquarters, one command radio company and elements of the command cable and wire company (special equipment section, cable splicer section, cable and wire support platoon, and army CP cable and wire platoon) are located near army main. The other command radio company and elements of the cable and wire company (cable and wire support platoon and army CP cable and wire platoon) are located near army alternate. Battalion command control of elements of the battalion located at the various echelons of the field army headquarters is exercised by the battalion commander through battalion officers at these locations.

13-13. Multichannel Communications

Note. The information in this paragraph describes army main but applies equally to army alternate.

The command radio relay terminal platoon operates both the multichannel radio terminals and the multiplex terminals at army main (fig. 13-2). The multichannel radio terminals are located in the vicinity of the command post and the multiplex terminals are located within the command post. The corps radio relay platoon of the command radio company provides the three multichannel radio terminals at the army main CP and the three multichannel radio terminals at the corps main CPs, plus the required multichannel radio repeaters for these links. The support radio relay platoon provides the multichannel radio terminals to army rear and to one-half of the major subordinate field army units, other than the three corps. This platoon also provides the required multichannel radio repeaters for these links.

13-14. HF Radio Communications

a. HF radio teletypewriter nets (fig. 3-7) are established to carry part of the normal load of

the command communications system. The army command signal radio and cable battalion establishes six command nets, and provides the personnel and equipment for these nets. It establishes four army air request nets, but only provides the equipment and personnel located at army main and army alternate. Corps and division stations operating in these nets are provided by their respective corps and division signal battalions. The radio and cable battalion establishes an army-adjacent army liaison net, and provides both personnel and equipment for the stations in this net. The radio and cable battalion also provides two radio stations which operate in the communications system control net of the army signal brigade. When a requirement exists for establishing army-ground liaison officer nets, additional TOE 11-500 teams will be needed. The total HF radio resources of the radio and cable battalion are divided equally between the two command radio companies.

b. Similar HF radio facilities are installed at army main and alternate. Those at the army main CP are designated net control stations (NCS) and those at the army alternate CP are designated alternate NCS. The HF equipment at each CP consists of three separate multireceiver and three separate multitransmitter configurations operating in the six command nets and in three of the army air request nets. This equipment is located in separate transmitter and receiver parks to eliminate mutual interference and for security reasons. The equipment is not configured to include teletypewriter sets. The teletypewriter equipment used in conjunction with these nine stations is installed in three telegraph terminal vans normally located at the FATOC. This teletypewriter equipment is organic to the elements of the army command signal operations battalion that are located at the respective CP. The remoted teletypewriter sets pass traffic from the telegraph terminals over circuits which are routed through a patching central (also organic to the signal command operations telephone company) in the FATOC area to the technical control facility operated by the command radio company. At this point, the circuits are interconnected with keying lines connected to the transmitter and receiver configurations. Although the radio teletypewriter station in air request net No. 4 is configured to include both HF receiver and transmitter equipment and teletypewriter equipment, it is remotely operated from the FATOC. Thus, all hard copy teletype-

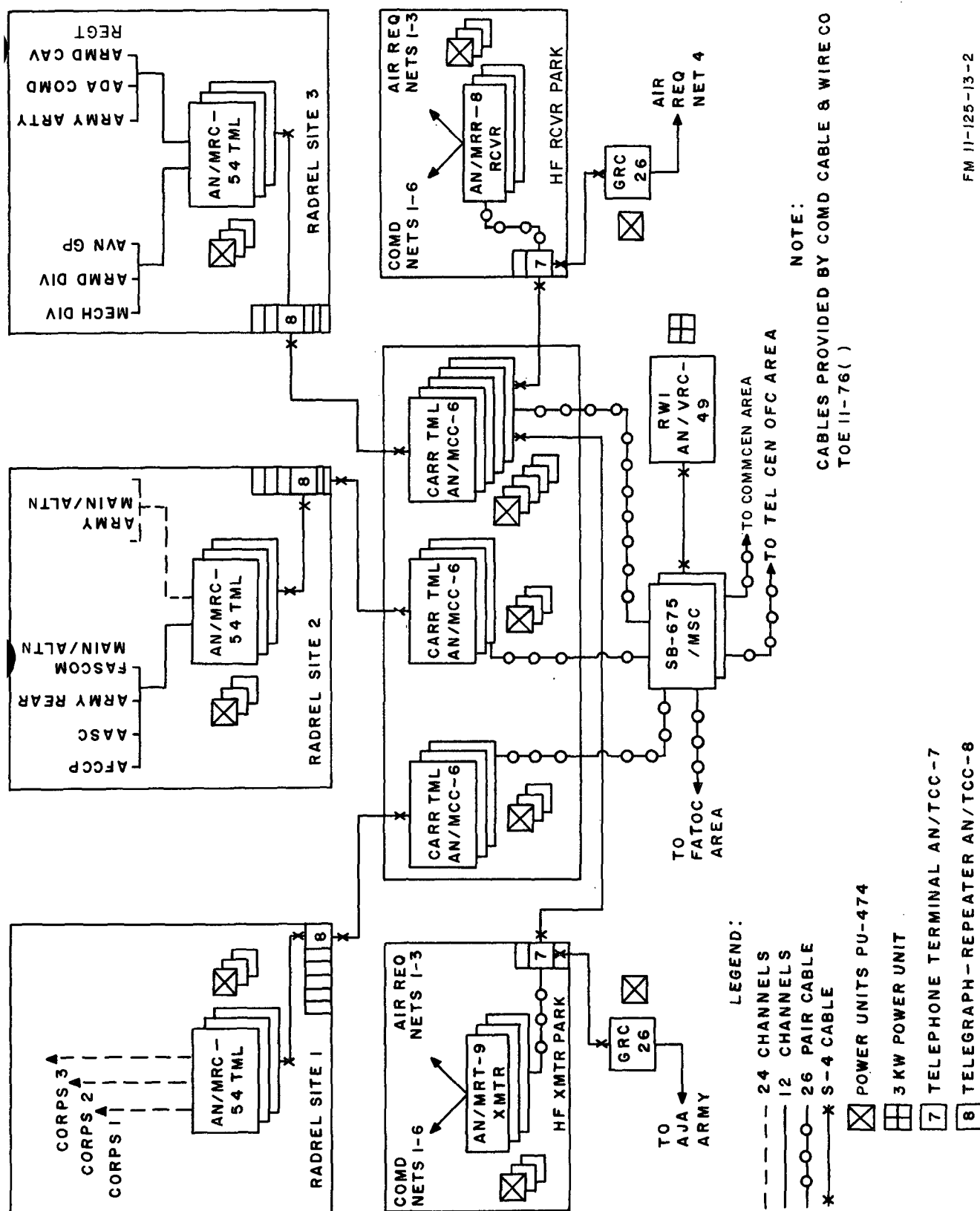


Figure 19-2. Type command communications equipment configuration.

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writer equipment operating in these nets is centrally located.

c. The remaining 11 HF radio teletypewriter stations, organic to each command radio company, operate in the nets shown in figure 3-7. Two are provided by each company for the army-adjacent army liaison net. The NCS and alternate NCS for this net are determined by agreement between the two army signal officers. If the adjacent unit is a separate corps, the stations at army main and alternate are designated NCS and alternate NCS respectively. An HF radio teletypewriter station is provided by each command radio company and they operate as secondary stations in the army signal brigade SYS-CON net. The remaining eight radio teletypewriter stations, organic to each company, are attached to designated subordinate army unit headquarters and operate as secondary stations in the six command nets.

13-15. Cable and Wire Communications

a. The command cable and wire company provides wire and cable support to the command radio companies operating at army main and army alternate. It also installs and maintains wire and cable circuits between echelons of army headquarters, and between these echelons and headquarters of subordinate army units are required.

b. The command cable and wire company is so organized that one wire and cable platoon is located at army main and the other platoon is located at army alternate. The platoons install and maintain wire and cable systems between the multichannel radio sites and the multiplexing equipment, between the multiplexing equipment and the technical control facility, and between the transmitter and receiver parks and the technical control facility. All of these equipments and facilities are organic to the command radio company located at either army main or army alternate CP. The responsibility of the command cable and wire company for wire systems terminates at the technical control facility. Wire or cable systems entering the technical control facility from the FATOC patching panels or other communication equipment configurations organic to units of the army command signal operations battalion are the responsibility of that battalion.

c. One wire and cable support platoon provides the cable associated with the army/corps multichannel communications system.

d. Wire and cable teams may be utilized to in-

stall and maintain long locals or cable systems between echelons of army headquarters and major subordinate units if such requirements exist and the command cable and wire company can support them from existing resources. The same applies to the rehabilitation of existing indigenous wire and cable systems.

e. The special equipment and cable splicer sections organic to the command cable and wire company provide specialized services. They assist the wire and cable teams in erecting pole lines, burying cable, and performing cable splicing operations on new or existing wire and cable systems.

13-16. Displacement

a. The battalion TOE provides personnel and equipment for reduced operations during displacement of army main and alternate headquarters. Army rear rear displaces in one echelon. There are several methods of displacing the army main and army alternate headquarters. Two methods are as follows:

(1) Operations close at army main and all personnel and equipment are moved as an entity to the new CP location. Army alternate exercises control until army main is prepared to resume operations. Army alternate is then closed and moved to its new location and again serves as the alternate headquarters.

(2) Communication facilities for each fragment (CP) of army headquarters are displaced as required to maintain operations. Minimum essential communications are installed at the new location to enable the headquarters to begin operations. Communications are phased out of the old location and built up in the new location as rapidly as movement of elements of the headquarters will allow until the old location is completely closed.

b. The army ACSC-E furnishes advance notice of any anticipated displacement. This permits multichannel radio systems to be planned and cable route surveys to be made. Reconnaissance of areas for multichannel terminals, radio parks and other communications equipment locations must be made before the displacement occurs.

13-17. Communications Control (fig. 13-3)

The operations and intelligence section of the army command signal radio and cable battalion operates a communications operations center

(van) at army main. The command radio company operates an operations central (shelter) at army main to control the radio company's technical

operations. The command radio company also provides patching panels to monitor system installation, test system quality, and route circuits.

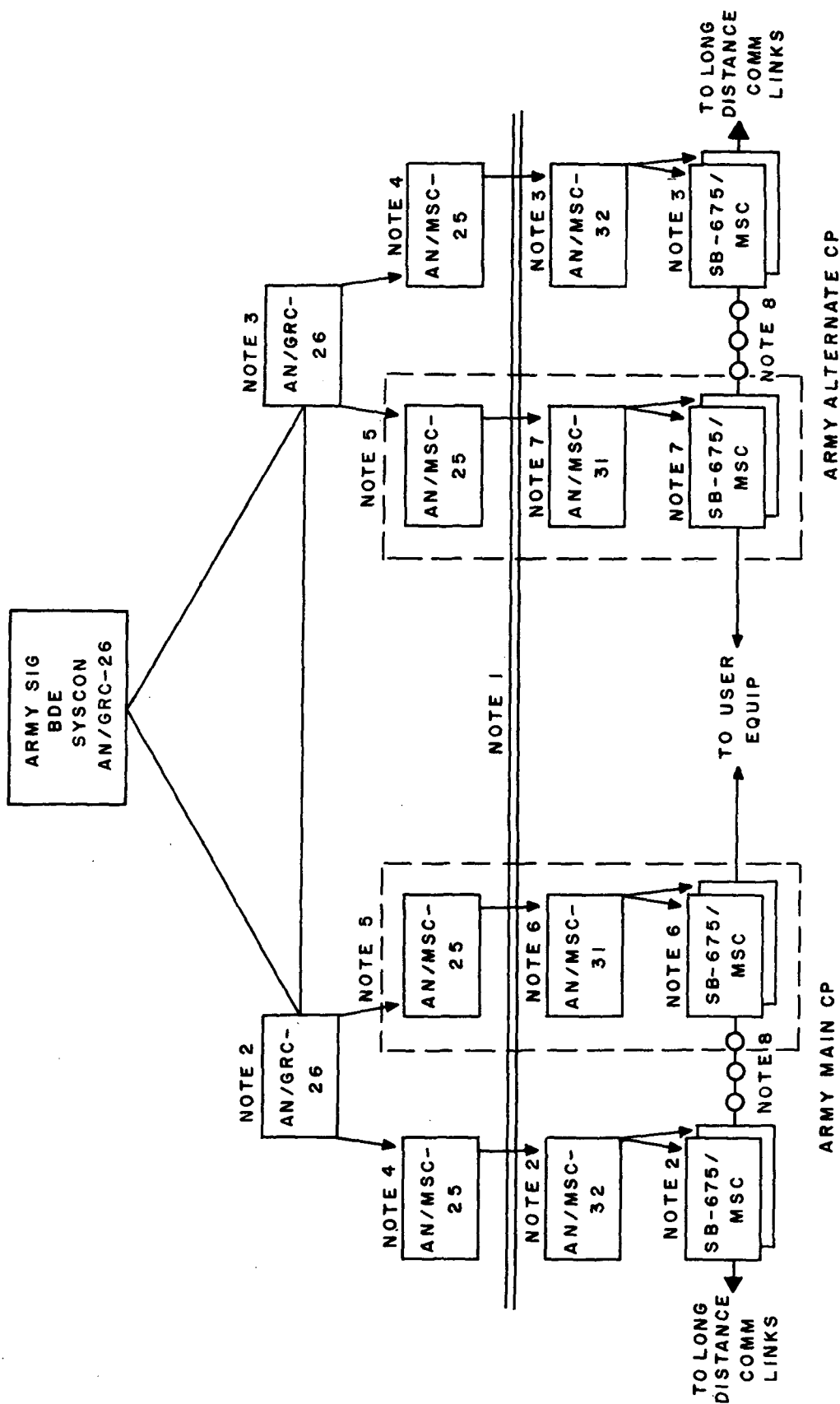


Figure 13-3. Type systems control and technical control centers.

CHAPTER 14

HEADQUARTERS AND HEADQUARTERS COMPANY

ARMY COMMAND SIGNAL RADIO AND CABLE BATTALION

Section I. UNIT CHARACTERISTICS

14-1. Introduction

The headquarters and headquarters company provides the means by which the battalion commander exercises command, administrative, operational, and logistical control over the companies of the battalion.

14-2. Mission

The mission of the headquarters and headquarters company is to direct and coordinate the operations of a command signal radio and cable battalion and attached elements.

14-3. Assignment and Allocation

A headquarters and headquarters company (TOE 11-76) is organic to an army command signal radio and cable battalion (TOE 11-75). Normal command channels exist between the company and the battalion. Refer to paragraph 14-11 for the operational concept.

14-4. Capabilities

When the headquarters and headquarters company is organized at full TOE strength, it is approximately 80 percent mobile. It can perform its mission within the capabilities listed below.

a. Full Strength Capabilities. At level 1 (full strength), this unit has the following capabilities:

(1) Provides command and control, staff planning, and supervision of the battalion; provides operational control for attached signal elements of the brigade.

(2) Provides religious services for the battalion.

(3) Provides battalion level administrative, and supply services to include aerial resupply and evacuation of critical communications items employed at multichannel radio relay sites and other isolated signal installations that are installed, op-

erated, and maintained by elements of signal units assigned to the battalion.

(4) Provides battalion level organizational maintenance of vehicles and power generators organic to the battalion; to include organizational maintenance of small arms, aircraft, avionics equipment, vehicles and power generators organic to the headquarters company.

(5) Provides mobile (air and motor) direct support level electronics maintenance facilities to supplement the direct support level electronics maintenance provided by companies organic to the battalion.

(6) Provides a systems control and technical control center for battalion operations at an echelon of the field army headquarters.

(7) Provides aerial reconnaissance of HF radio and multichannel radio sites and routes to be used for the installation of wire and cable circuits by units organic to the battalion.

(8) Provides unit administration, mess, supply, and organizational maintenance of organic arms for the headquarters and headquarters company of the battalion.

b. Reduced Strength Capabilities. The headquarters and headquarters company may be organized at TOE strength and equipment authorization level 2 (90 percent) or level 3 (80 percent). At such instances, the sustained operational capabilities of this company are reduced to 90 and 80 percent of full-strength effectiveness.

14-5. Limitations

This unit depends upon:

a. Appropriate units in the area for medical, dental, personnel supplemental transportation, and finance support.

b. The command radio company of the battal-

ion for HF radio communications in the army signal brigade system control net.

c. Appropriate TOE 29-500 teams for additional aircraft when operating in Southeast Asia or a similar environment.

14-6. Category

The headquarters and headquarters company is

organized and designated as a category II unit (AR 310-25).

14-7. Mobility

When the headquarters and headquarters company is at full TOE strength, it is approximately 80 percent mobile.

Section II. ORGANIZATION AND EMPLOYMENT

14-8. Introduction

The headquarters and headquarters company has the function of providing command and coordination of the overall activities of the battalion to include systems control and administrative and logistical support for the units organic to the battalion. The functions of the company elements are described in detail below.

14-9. Organization

The headquarters and headquarters company is organized and designated as a category II unit (AR 310-25). The organization (fig. 14-1) has the following elements:

a. Battalion headquarters.

b. Headquarters company.

(1) Company headquarters.

(2) Administration and logistics section.

(3) Operations and intelligence section.

(4) Battalion motor maintenance section.

(5) Battalion signal maintenance section.

(6) Battalion aviation section.

14-10. Employment

The company normally is employed in one echelon and is collocated with the battalion headquarters at either the main or alternate command post of the field army.

Section III. CONCEPT OF OPERATION

14-11. Introduction

The headquarters and headquarters company (HHC) provides the direction and support that is normal for a signal battalion. In addition, it has certain unique functions that are parts of the battalion combat support mission. Paragraphs 14-12 and 14-13 give details about operations performed by elements of the company.

14-12. Battalion Headquarters

The battalion headquarters includes the battalion commander and the battalion staff. The staff assists the battalion commander in exercising command control and staff supervision over the battalion's operational units and insures that orders and instructions of the army signal brigade commander are complied with.

14-13. Headquarters Company

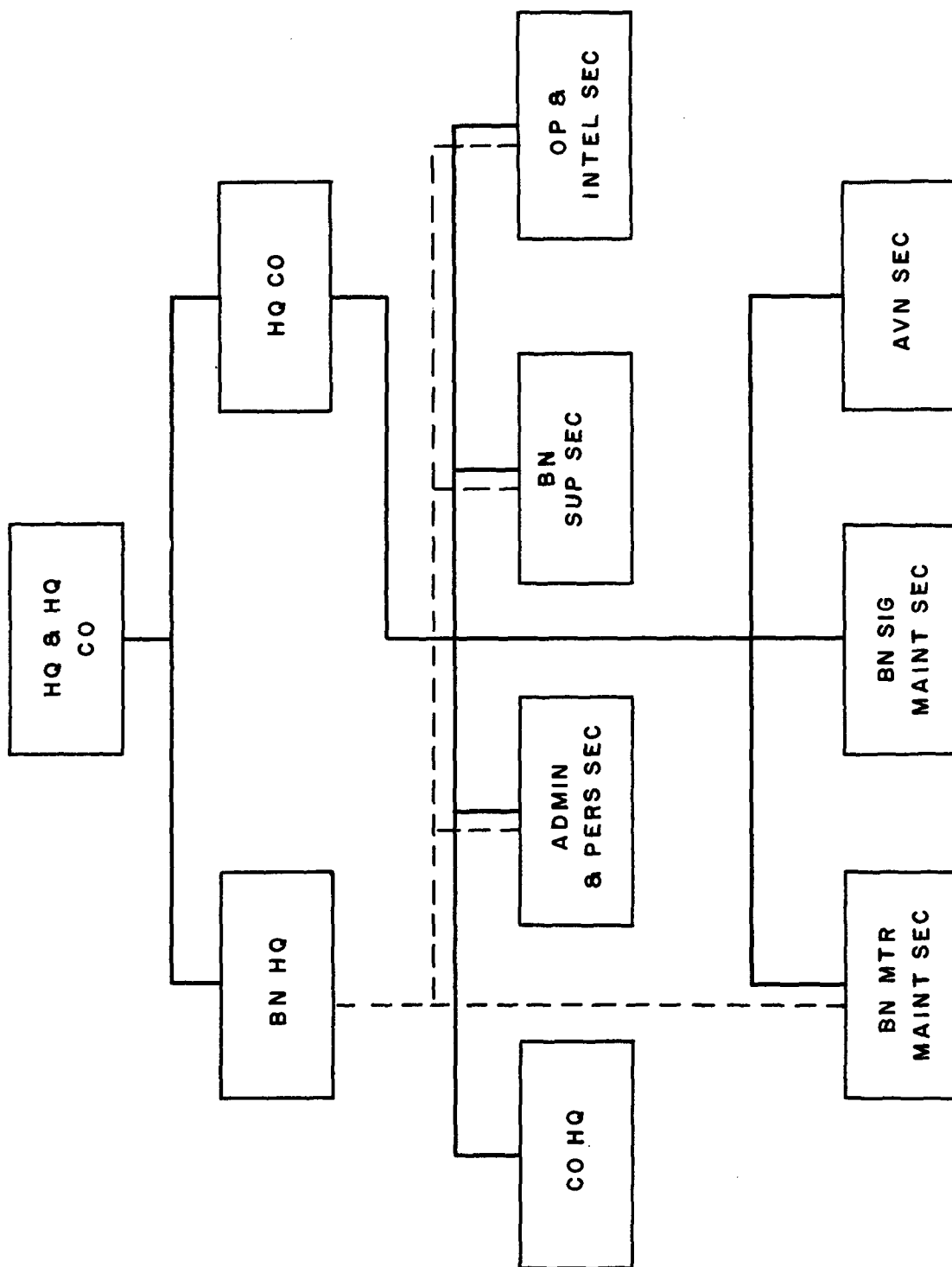
The headquarters company (TOE 11-76) includes a company headquarters and seven operating sections (fig. 14-1). Descriptions of these headquarters company elements follow in a through f below.

a. *Company Headquarters.* The company headquarters includes personnel and facilities for

command, control, and coordination of the company's training and operational mission. The company headquarters maintains technical supervision and overhead personnel for unit administration, mess, supply, and organizational maintenance of organic vehicles and weapons. In addition to 24-hour mess facilities, it provides internal communications for the headquarters and headquarters company and operates and maintains the power generators that provide power for the battalion headquarters. A switchboard operator and powerman are authorized to perform these functions; other company personnel are cross-trained to assist the switchboard operator.

b. *Administration and Logistics Section.* The administration and personnel section contains the necessary personnel and equipment to provide administrative and logistics assistance for the battalion headquarters and headquarters company. Administrative personnel in this section are under the staff supervision of the S1 and under the supervisory control of the unit personnel technician. The logistics personnel are under the staff supervision of S4.

c. *Battalion Signal Maintenance Section.* The battalion signal maintenance section also oper-



LEGEND:

--- INDICATES OPERATIONAL CONTROL

— INDICATES COMMAND CONTROL

Figure 14-1. Headquarters and headquarters company.

ates under the staff supervision of the battalion S4 with the communications-electronic technician being responsible for direct supervisory control of the section. The section is responsible for direct support level maintenance on HF radio, multichannel radio, cryptographic, and teletypewriter equipment organic to units assigned to the battalion. Supplemental onsite maintenance is performed by two mobile HF radio and teletypewriter repair facilities and two mobile VHF radio repair facilities. Normally, these repair facilities are paired and each pair operates in support of one of the organic command radio companies of the battalion. These teams may use the organic aircraft of the battalion to reach otherwise inaccessible areas.

d. Operations and Intelligence Section. This section provides commissioned and enlisted personnel to support the battalion's operations, intelligence, and training missions. The section operates under the staff supervision of the S3 operations officer and under the direct supervision of the assistant S3. Its primary responsibility is the operation of two operations centrals: one located at the field army main CP and the other located at the field army alternate CP. This responsibility also involves directing, supervising, and controlling long-distance communication facilities installed, operated, and maintained by units organic to the army command radio and cable battalion. Close liaison is established and maintained between this section and the SYSCON section of the army signal brigade and the technical control facilities of the army command signal operations battalion and the army area signal battalions. The section is also responsible for insuring implementation of intelligence and training directives from the army signal brigade and higher headquarters.

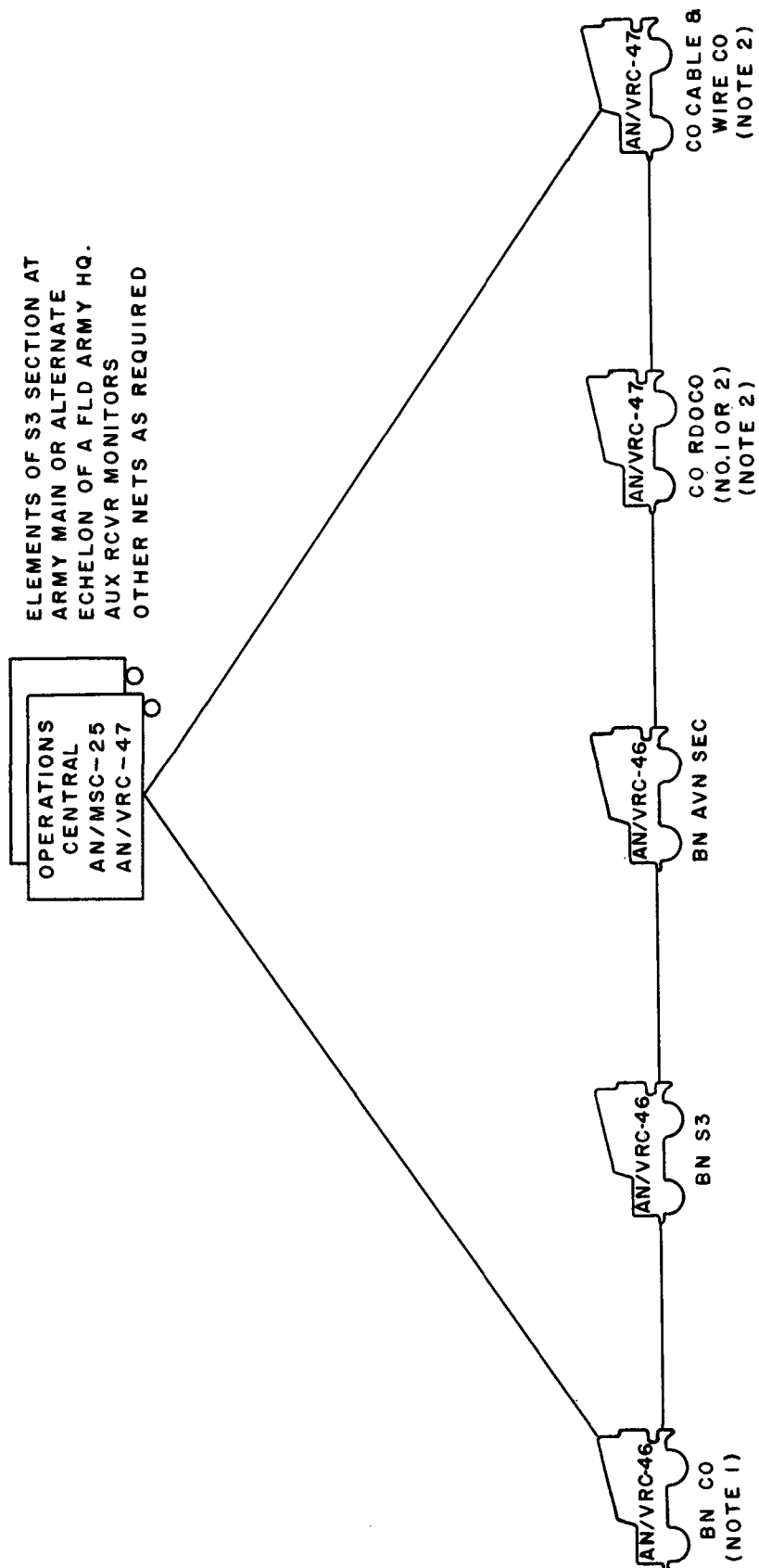
e. Battalion Motor Maintenance Section. The battalion motor maintenance section operates under the staff supervision of the battalion motor officer. It furnishes organizational motor vehicle and power generator maintenance for the headquarters and headquarters company, augments the motor vehicle and power generator maintenance capability of the organic companies, and supervises the motor vehicle and power generator maintenance of the battalion.

f. Battalion Aviation Section. The battalion aviation section consists of a section leader, eight helicopter pilots, and the required maintenance and ground crews. It is authorized one observation and four utility helicopters which are used to provide the battalion commander and his staff with aviation resources needed for command and control, reconnaissance, limited resupply, air messenger service, and other aviation missions as outlined in FM 1-105. The section is under the operational control of the battalion S3. The section leader serves as the battalion aviation officer and provides assistance and advice to the commander on all matters pertaining to Army aviation. He coordinates aviation requirements which are in excess of the battalion aviation section's capabilities with the brigade S3.

14-14. Headquarters and Headquarters Company Internal Communications

a. FM Radio Communications. The headquarters and headquarters company is authorized five frequency-modulated (FM) radio sets. A typical battalion command net with the type of equipment used is shown in figure 14-2. This net consists of the battalion commander's set, the S3's set, the aviation section's set and a set in each of the two operations central. Either command radio company and the command cable and wire company may have a station in this type net also. The net control station is normally the battalion commander's set, but during certain operations, another station may be designated NCS by the battalion commander. (The battalion operations and intelligence section is furnished a high-frequency radio teletypewriter set by one of the command radio companies (TOE 11-77) for transmitting and receiving traffic in the army signal brigade SYSCON net.)

b. Wire Communications. The headquarters and headquarters company is authorized two switchboards and sufficient wire and telephones to install and operate the battalion internal wire system which is shown on figure 14-3. The command cable and wire company of the battalion furnishes support in the laying of long local or trunk circuits.

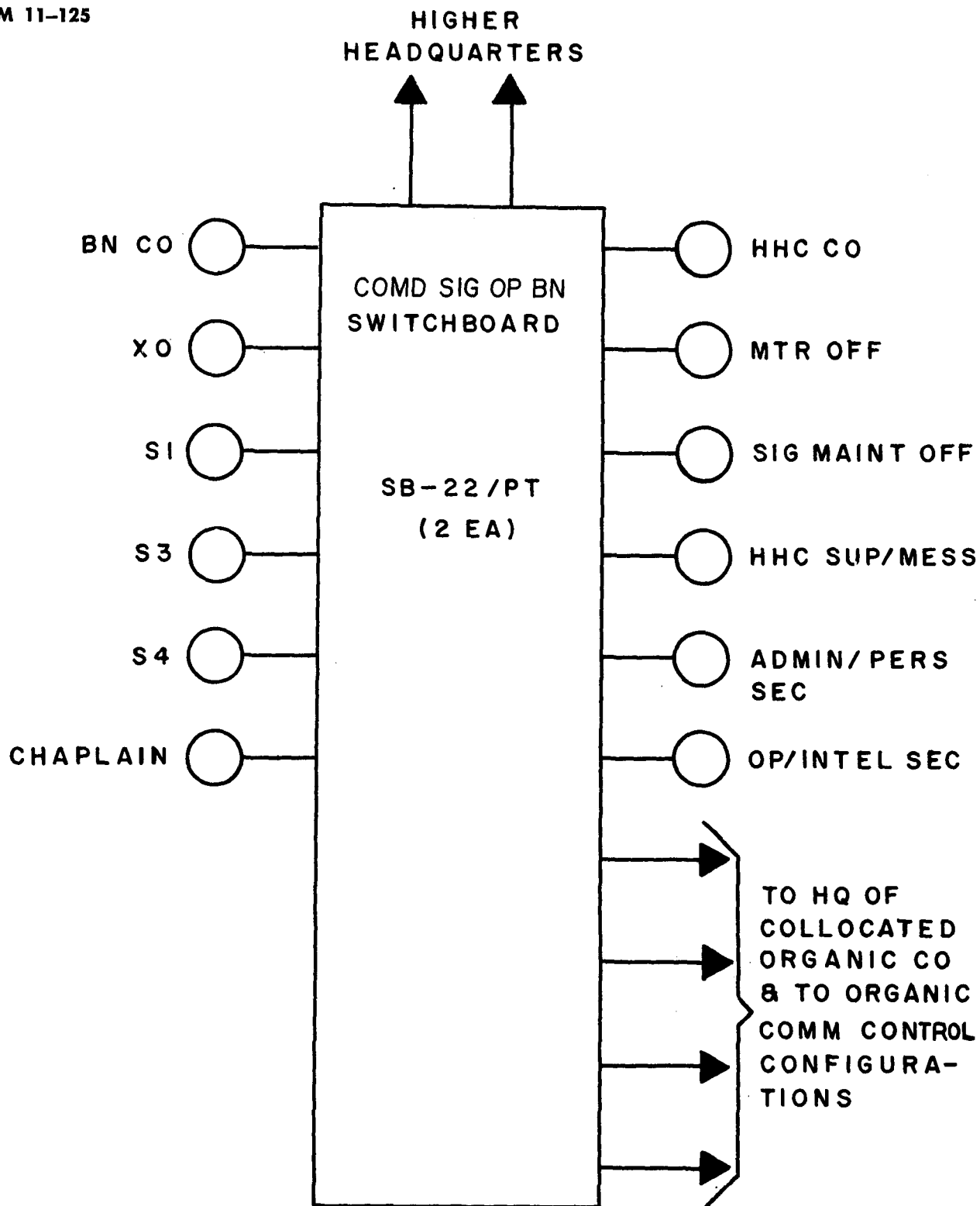


NOTES:

1. NCS DETERMINED BY BN CO.
2. ALSO OPERATES IN COMPANY NET.
3. THIS TYPE COMMAND NET ESTABLISHED BY BN CO AT EITHER ARMY MAIN OR ALTERNATE CP.

FM 11-125-14-2

Figure 14-2. Type army command signal radio and cable battalion command net.



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FM 11-125-14-3

Figure 14-3. Type internal telephone network of battalion headquarters and headquarters company.

CHAPTER 15

COMMAND CABLE AND WIRE COMPANY

ARMY COMMAND SIGNAL RADIO AND CABLE BATTALION

Section I. UNIT CHARACTERISTICS

15-1. Introduction

This chapter describes the organization of a command cable and wire company. It presents a method of employing the company to accomplish its mission at the echelons of a field army headquarters and between these echelons and the headquarters of major subordinate units assigned or attached to the field army. Specific tactical situations may require modification of the method of employment presented herein.

15-2. Mission

The mission of a command cable and wire company is:

a. To install and maintain command communications field cable and field wire circuits between the echelons of a field army headquarters and to the headquarters of major subordinate units as required.

b. To rehabilitate and maintain field wire and open wire lines, and field and lead-covered cable of indigenous communications facilities available to a field army headquarters.

c. To install and maintain field cable circuits between multichannel radio sites and the patching panel equipment at the supported headquarters.

15-3. Assignment and Allocation

A command cable and wire company (TOE 11-78) is organic to an army command signal radio and cable battalion. Normal command channels exist between the company and the battalion. Refer to paragraph 3-10 for the operational concept.

15-4. Capabilities

When the command cable and wire company is organized at full TOE strength, it is approximately 80 percent mobile. It can perform its mission within the capabilities specified below.

a. Full Strength Capabilities. At full strength (level 1), this unit has the following capabilities:

(1) Provides twelve 8-man wire installation teams, to be employed as required, for installation and maintenance of field cable and field wire between a field army headquarters and subordinate units; between echelons of a field army headquarters; between communications equipment configurations located at various sites within the army CP area and the patching panels interconnecting these configurations; and for rehabilitation of indigenous lead-covered cable and open-wire lines.

(2) Provides twelve 3-man installation teams to connect the multichannel terminals to the technical control facilities (patching panels) at the army and the corps command post locations.

(3) Provides three 2-man cable-splicing teams for rehabilitation and maintenance of indigenous lead-covered cable facilities.

(4) Provides special type motor vehicles and equipment to be employed as required for construction, maintenance, and rehabilitation of telephone line facilities.

(5) Provides unit administration, supply, and mess facilities and organizational maintenance of organic weapons, vehicles, and signal equipment.

b. Reduced Strength Capabilities. The command cable and wire company may be organized at TOE strength and equipment authorization level 2 (90 percent) or level 3 (80 percent). At such instances, the sustained operational capabilities of this company are reduced to 90 and 80 percent of full-strength effectiveness.

15-5. Limitations

The command cable and wire company has the following limitations: it depends upon the headquarters and headquarters company of the battalion.

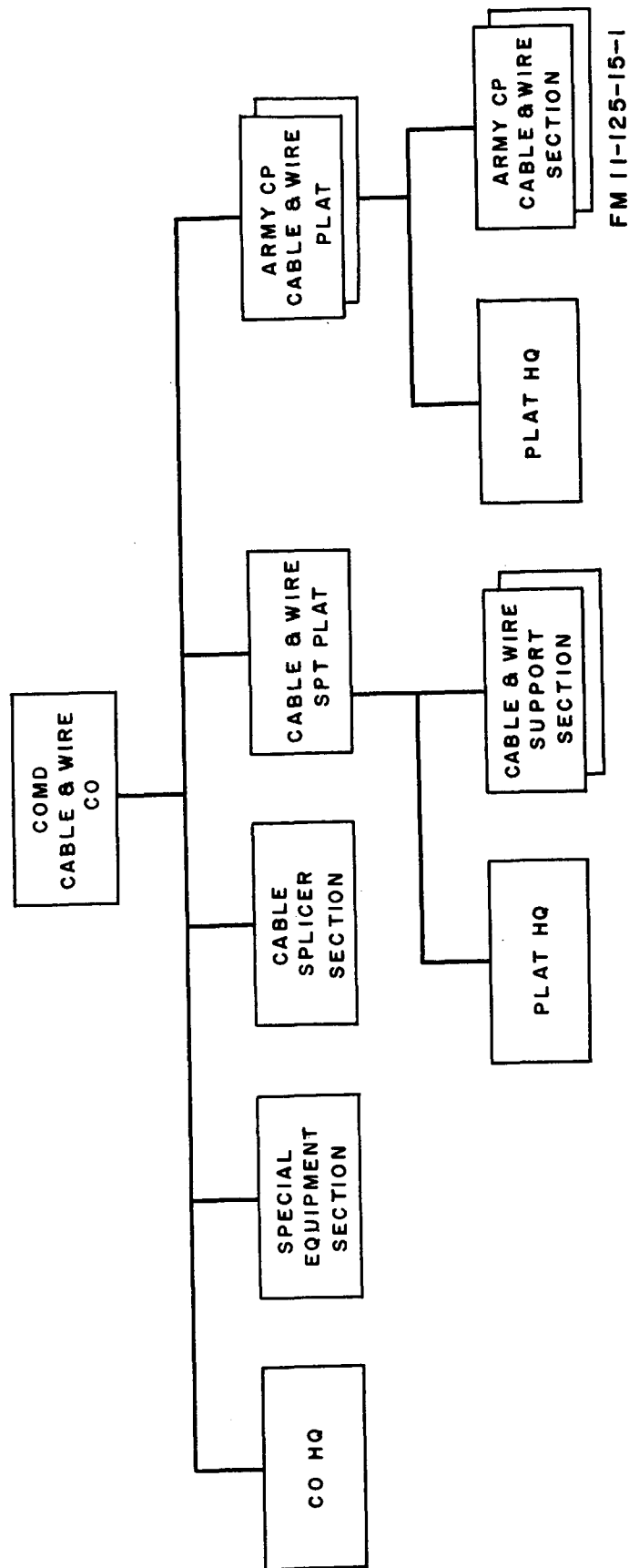


Figure 15-1. Command cable and wire company organization.

ion for consolidated personnel administration, battalion level motor maintenance, direct support level signal maintenance, and religious services.

Section II. ORGANIZATION AND EMPLOYMENT

15-7. Introduction

The command cable and wire company installs and maintains 26-pair cable, special-purpose cable (coaxial), spiral-four (where required), and field wire circuits necessary to support the communications facilities of an army command communications system. This company provides cable and wire support to the two command radio companies of the battalion and to the two communications center companies and the two telephone operations companies of the army command signal operations battalion. In addition, this company is responsible for the rehabilitation and maintenance of available indigenous wire and cable facilities.

15-8. Organization

The command cable and wire company is orga-

15-6. Category

The cable and wire company is designated a category II unit (AR 310-25).

nized as a category II unit. The company has the following major elements (fig. 15-1).

- a. Company headquarters.
- b. One special equipment section.
- c. One cable splicer section.
- d. One cable and wire support platoon.
- e. Two army CP cable and wire platoons.

15-9. Employment

The command cable and wire company is employed between the echelons of field army headquarters and the headquarters of designated major units assigned or attached to the field army. The company is organized into teams primarily according to the facilities each provides.

Section III. CONCEPT OF OPERATION

15-10. Introduction

The command cable and wire company is organized and equipped to establish, operate, and maintain the communications facilities described in paragraph 15-7.

15-11. Company Headquarters

The company headquarters provides command and administrative control and coordination of the company's training and operational mission. Company headquarters is normally located adjacent to the battalion headquarters and headquarters company.

a. *Command and Control.* The company commander maintains command and control through the commissioned and noncommissioned officers of the company by making maximum practical use of company and platoon standing operational procedures for the mission and support activities of the company. This is particularly important in the command cable and wire company because of widely dispersed company elements.

b. *Administration and Logistics.* The company headquarters conducts its administrative and logistical operations with normal support from

comparable activities at battalion level. Messing facilities are available at the company mess 24 hours a day. Other messing facilities are provided by the supported headquarters. Supply operations are geared to the heavy volume of electronic and tactical vehicle repair parts required for continuous employment of the company's electronic equipment and tactical vehicles.

c. *Coordination.* The cable and wire facilities provide by the command cable and wire company interconnect the facilities furnished by the two radio companies of the battalion as well as the facilities provided by the army command signal operations battalion (TOE 11-95). The company commander, therefore, coordinates with the battalion staff, the battalion technical control facility, and with all units associated with the company's multichannel field cable and wire facilities.

d. *Internal Radio Communications.* The commander of the command cable and wire company operates simultaneously in two FM radio nets (fig. 15-2). He uses an FM radio mounted in a 1/4-ton vehicle. This set is used as the net control station (NCS) of the company command net and as a secondary station in the battalion command

net. The platoon leaders of the cable and wire support platoon and the army CP cable and wire platoons have FM radios which are used as secondary stations in the company command net. The company commander, by using the two receivers of his set, can monitor two frequencies simultaneously. He can transmit on either frequency as required by switching transmitter channels.

15-12. Internal Telephone Communications

The command cable and wire company telephone communications system (fig. 15-3) is provided by

the company headquarters section. The diagram show 10 local telephones connected to a local battery telephone switchboard and used by the company commander and the operating elements of the company for command and control and coordination of two trunk circuits to battalion or other higher headquarters. Installation and priority of the local telephones and the trunks to higher headquarters will be governed by the SOP's of the battalion and company respectively.

15-13. Army CP Cable and Wire Platoon

There are two army command posts (CP) cable

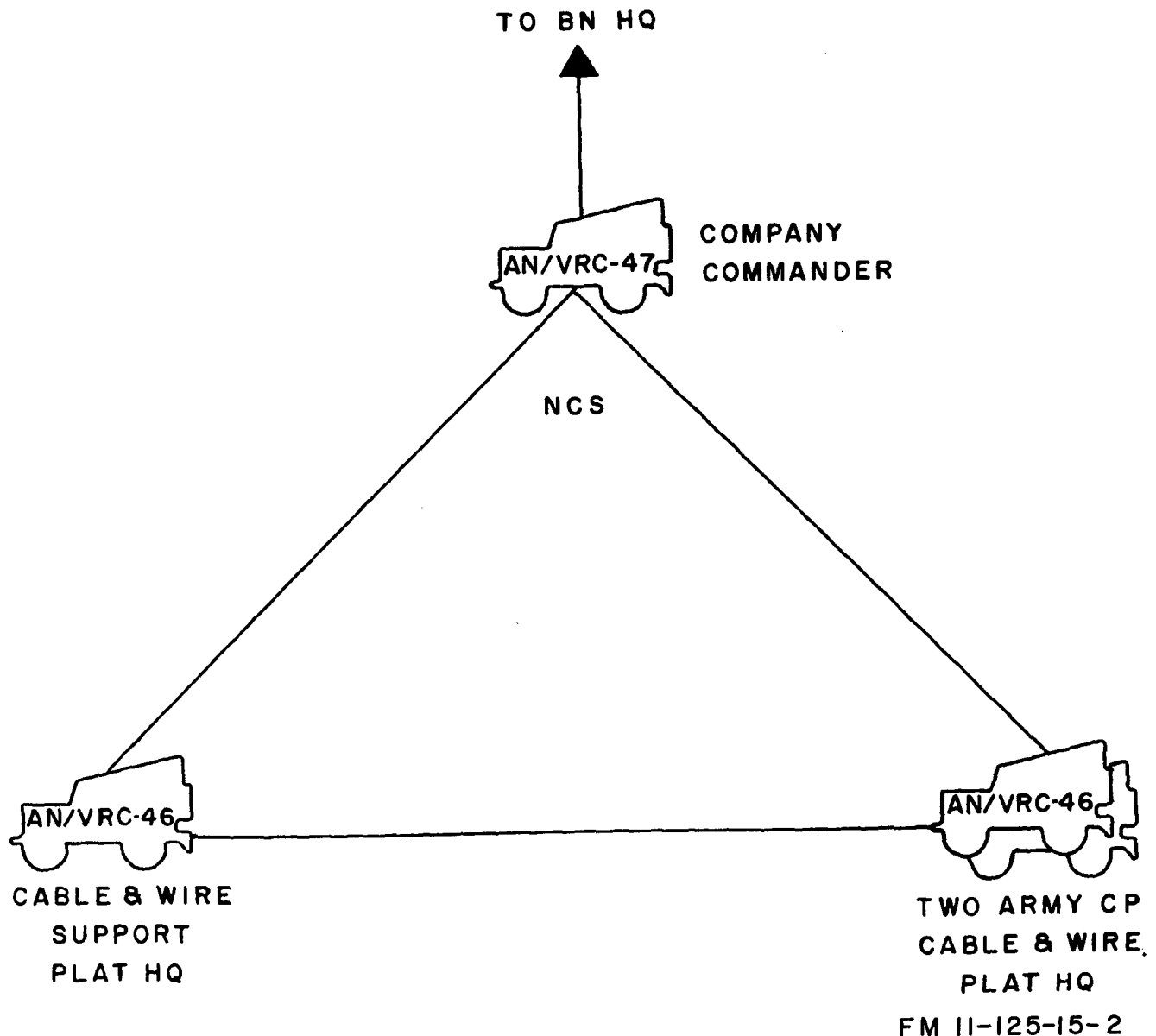


Figure 15-2. Type company command FM radio net.

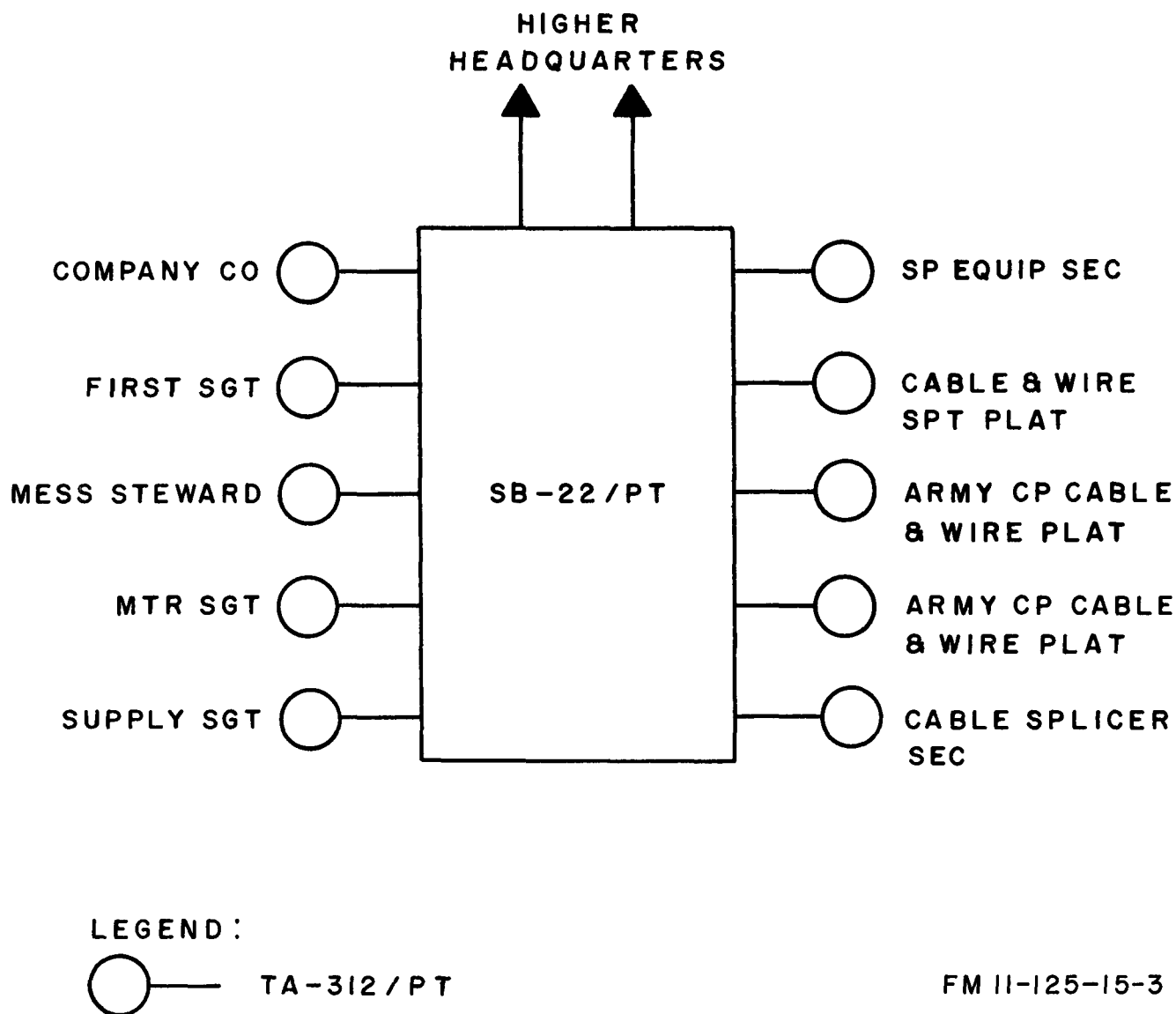


Figure 15-3. Type command cable and wire company internal telephone communications system.

and wire platoons in the command cable and wire company. The information that follows in this section applies equally to each platoon, unless otherwise stated.

a. Mission. In performing their collective mission, the two platoons install and maintain special purpose cable, 26-pair cable, spiral-4 cable (where required), and field wire circuits between echelons of a field army headquarters and to subordinate headquarters as required and between multichannel terminals and the communications patching panels. In addition, they rehabilitate and maintain indigenous cable and open-wire lines.

b. Organization. Two army CP cable and wire

platoons are organic to the command cable and wire company (fig. 15-1). Each platoon has the following major elements.

(1) An army CP cable and wire platoon headquarters.

(2) Two army CP cable and wire sections.

c. Operation. Elements of the platoon operate simultaneously, as required, between the installations described in *a* above. Each of the two army CP cable and wire sections is organized into three 8-man functional cable and wire teams. The largest groupment of teams is at the army main and army alternate signal centers. For this reason, one platoon normally is located at the army main

signal center and the other at the army alternate signal center. The actual number of teams at any installation depends upon the amount of work required and the priority assigned to the construction activity.

d. Army CP Cables and Wire Platoon Headquarters. The army CP cable and wire platoon headquarters provides normal command and control for the platoon activities. The platoon leader coordinates cable and wire requirements pertaining to the platoon and reconnoiters cable and wire routes and assigns teams as required. The platoon sergeant assists the platoon leader in these function and records cable and wire installations and terminations. The platoon headquarters vehicle driver is a qualified wireman and may be required by the platoon leader to perform duties as such under exceptional circumstances or simply to maintain his skill in his MOS. Deployment of teams in this platoon over extended distances requires the platoon leader and his assistant, to expend much of their effort in coordination and inspection of team activities.

e. Army CP Cable and Wire Sections. Each army CP cable and wire platoon consists of two sections. Each section has a section chief and three wire teams. Each of these wire teams has eight men including one team chief, two senior wiremen, and five wiremen. Thus, each platoon has a total of six 8-man wire teams. The six teams of each platoon install and maintain field cable and field wire circuits between the echelons of the field army headquarters and to subordinate units, as required, and perform other activities as required. The section chief, in addition to directing the teams in his section, assists the platoon leader and platoon sergeant in reconnoitering wire and cable routes.

15-14. Cable and Wire Support Platoon

a. Mission. In performing its mission, the cable and wire support platoon of the command cable and wire company installs and maintains field cable and field wire circuits between multichannel terminals and the communications patching panels at army and corps CP's and rehabilitates and maintains indigenous cable at army and corps command post locations.

b. Organization. One cable and wire support platoon is organic to the command cable and wire company (fig. 15-1). The platoon has the following major elements.

(1) A cable and wire support platoon headquarters.

(2) Two cable and wire support sections.

c. Operation. The cable and wire support platoon conducts its operations on a continuous basis. Elements of the platoon operate simultaneously at army and corps command post locations and between multichannel radio terminals and the communications patching panels. Rehabilitation and maintenance of indigenous wire and cable facilities take place in the vicinity of these areas wherever and whenever advantageous use can be made of such facilities.

15-15. Cable and Wire Support Platoon Operations

a. General. The cable and wire support platoon installs and maintains field cable and field wire circuits between multichannel terminals and the communication patching panels at army and corps CP's, and rehabilitates and maintains indigenous cable at army and corps command post locations.

b. Cable and Wire Support Platoon Headquarters. The cable and wire support platoon headquarters provides normal command and control of the platoon activities. The platoon leader coordinates with the platoon leaders of the CP cable and wire platoons and with the platoon leaders of the command radio relay platoons to assure necessary installation of cable and wire from terminals to the patching panel. The platoon sergeant assists the platoon leader by directing activities in accordance with established SOP's. When necessary, the platoon leader may require the light-truck driver to assist in the cable and wire activities. Deployment of the teams assigned to this platoon over extended distances requires the platoon leader and his assistant to expend much of their efforts in coordination and inspection of team activities.

c. Cable and Wire Support Section. There are two cable and wire support sections in the cable and wire support platoon. Each section has a section chief and six 3-man wire teams. Each of these wire teams has a team chief, one senior wireman, and one wireman. One section is employed at the army main and corps main CP's and the other is employed at the army alternate and corps alternate CP's. The team chiefs of these two sections, in addition to supervising the overall operation of the section, assist the platoon leader in reconnoitering routes and working areas which will be used by the sections.

15-16. Special Equipment Section

a. Mission. The special equipment section provides the company with special purpose equipment, six special type motor vehicles, and trained operating personnel to be employed as required by the organic cable and wire teams engaged in construction, maintenance, or rehabilitation of pole line facilities.

b. Organization. One special equipment section is organic to the command cable and wire company (fig. 15-1). The section is organized to form three 2-man teams.

c. Operation. The special equipment section conducts its operations on a continuous basis and is used wherever and whenever its special purpose equipment and trained personnel are needed to assist other operating units in the accomplishment of the company's mission. The special equipment section supports the organic cable and wire teams that are engaged in construction, maintenance and rehabilitation of pole line and cable facilities. A section chief supervises the overall operation of the section and operates one of the three line-construction vehicles. Five light vehicle drivers operate the remaining five vehicles.

These drivers also assist in the operation of the special equipment (cable-lashing, cable-laying, pole-raising, and earth-boring) mounted on the vehicles or contained in the three trailers which are towed by the three line trucks.

15-17. Cable Splicer Section

a. Mission. In performing its mission, teams of the cable splicer section are employed as required for rehabilitation and maintenance of indigenous lead-covered cable facilities that may be available in a field army headquarters area or the areas of major subordinate units.

b. Organization. The cable splicer section is organic to the command cable and wire company (fig. 15-1). The section is organized into three cable splicer teams each consisting of one cable splicer and one cable splicer helper.

c. Section Operations. The section chief supervises the overall operation of the section. Elements of the section operate simultaneously wherever and whenever the need arises. Each cable splicer team is furnished with a $\frac{3}{4}$ -ton maintenance truck and the necessary tools, equipment, and shelter to accomplish its mission.

CHAPTER 16

RADIO COMPANY, ARMY COMMAND SIGNAL RADIO AND CABLE BATTALION

Section I. UNIT CHARACTERISTICS

16-1. Introduction

This chapter describes the organization of a command radio company (fig. 16-1) and presents a method of employing the company to accomplish its mission of supporting the main CP or the alternate CP of a fragmented field army headquarters. Specific tactical situations may require modification of the method of employment presented herein.

16-2. Mission

The mission of a command radio company is to install, operate, and maintain command communications between the army main or alternate CP and designated army subordinate units; between echelons of army headquarters; and to adjacent units. The communications installed by a command radio company include HF radio teletypewriter nets (fig. 3-7) and multichannel radio communications (fig. 3-1).

16-3. Assignment and Allocation

Two command radio companies are organic to an army command signal radio and cable battalion (TOE 11-75) and unless otherwise stated, the following applies to both companies. Normal command channels exist between the companies and the battalion. Refer to paragraph 16-11 for the operational concept.

16-4. Capabilities

Each command radio company is organized at full strength to perform as indicated in *a* through *h* below.

Note. When the terms *24-channel system* or *12-channel system* appear in the following paragraph, they refer to the number of voice-frequency channels provided between headquarters or installations; they do not refer to the equipment that produces these channels.

a. Install, operate, and maintain multichannel radio facilities (with a 100 percent repeater capability in the army-to-corps links of the army com-

mand system and an approximately 50 percent repeater capability in the other links of the army command system) to support either the army main or army alternate CP of a field army headquarters, to include:

(1) Three 24-channel systems consisting of three 24-channel terminals located at the supported army CP (army main or army alternate) and one 24-channel terminal located at each of the three corps (three corps main CP's or three corps alternate CP's).

(2) One 24-channel terminal at either army main or army alternate to terminate the system between these echelons.

(3) Eight 12-channel terminals at army main or army alternate to terminate command systems to army rear, army artillery headquarters, air force support headquarters, army air defense artillery brigade, aviation brigade, armored cavalry brigade, armored division, and mechanized infantry division. Each of the command radio companies also provides four of the eight dual 12-channel terminals located at the subordinate headquarters stated above.

(4) One 12-channel link between army main or army alternate and FASCOM main or alternate.

b. Install, operate, and maintain army command HF radio teletypewriter communications nets as follows:

(1) Six stations at army main or army alternate, one to operate in each of the six command nets.

(2) Eight stations located at designated major army unit headquarters for operation in one of the six army command nets as required.

(3) One station at army main or army alternate and one station at the adjacent army main or army alternate for operation in one of these two point-to-point nets as required.

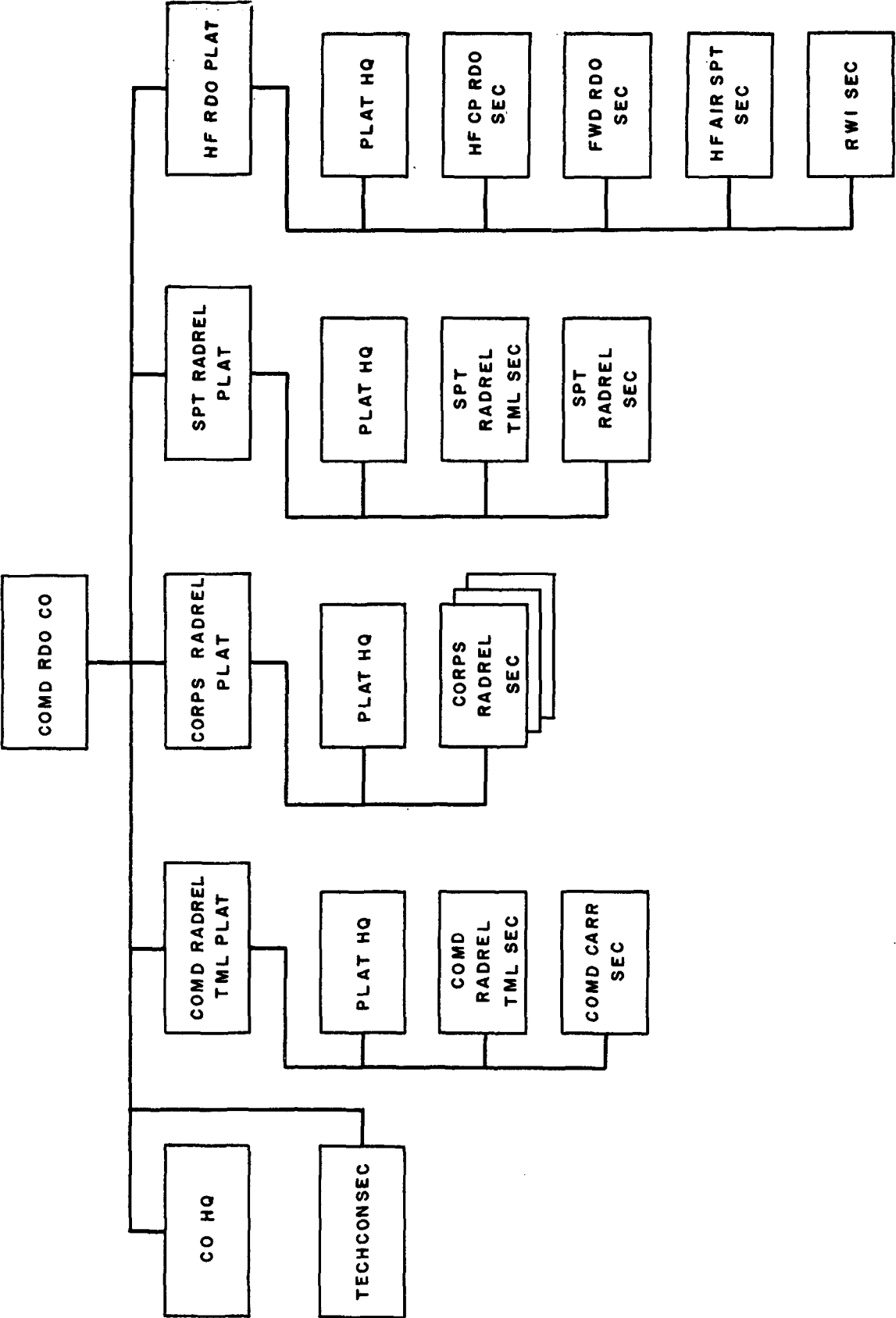


Figure 16-1. Organization radio company, army command signal radio and cable battalion.

(4) One station at either army main or alternate for operation in the system control net of the army signal brigade.

c. Provide the stations in each of four army air requests nets at the main or alternate echelons of the CP. (The station at army main normally is designated as NCS.)

d. Install, operate, and maintain an RWI facility at the supported echelon of army headquarters (main or alternate). (The RWI facility at army rear is provided by the army command signal operation battalion (TOE 11-95).)

e. Install, operate, and maintain two communications patching panels in the technical control center at army main or alternate.

f. Perform onsite direct support level maintenance on organic electronic equipment deployed in an operational communications system or complex.

g. Provide unit administration, supply and mess facilities, and organizational maintenance of organic arms, vehicles, and power equipment.

h. Engage in effective defense of its area or installation.

16-5. Limitations

The command radio company has the following limitations:

a. The command radio company may be organized at TOE strength and equipment authoriza-

tion level 2 (90 percent) or level 3 (80 percent). As such instances, the sustained operational capabilities of the company are reduced to 90 and 80 percent of full strength effectiveness.

b. The company is not adaptable to a type B organization.

c. The company depends on:

(1) The command cable and wire company of the battalion for installation of field cable.

(2) A signal army area company for the additional circuits required for entry into the army area communication system.

(3) The headquarters and headquarters company of the battalion for consolidated personnel administration, supplemental tactical vehicle maintenance, supplemental direct support level electronic maintenance, and religious services.

(4) Appropriate units in the area for medical service and supplemental transportation.

(5) Appropriate TOE 11-500 and TOE 29-500 teams when required to support army ground liaison officers teams and/or when additional air request capabilities are required.

16-6. Category

This unit is designated a category II unit (AR 310-25).

16-7. Mobility

The radio company is 80 percent mobile.

Section II. ORGANIZATION AND EMPLOYMENT

16-8. Introduction

The TOE for the command radio company (TOE 11-77G) is published with two sets (variations) or personnel and equipment allowances. These variations are indicated by Standard Requirements Code 11077G610 (SRC 11077G610) and Standard Requirements Code 11077G620 (SRC 11077G620). In this manual, the command radio company is described as organized under the SRC 11077G620 variation. This variation authorizes presently available multichannel equipments, together with the personnel required to install, operate, and maintain them.

16-9. Organization

Each command radio company is organized as follows:

a. Company headquarters.

b. Technical control section.

c. Command radio relay (RADRL) terminal platoon.

(1) Platoon headquarters.

(2) Command RADREL terminal section.

(3) Command carrier section.

d. Corps RADREL platoon.

(1) Platoon headquarters.

(2) Three corps RADREL sections.

e. Support RADREL platoon.

(1) Platoon headquarters.

(2) Support RADREL terminal section.

(3) Support RADREL section.

- f. High-frequency radio platoon.
 - (1) Platoon headquarters.
 - (2) High-frequency CP radio section.
 - (3) Forward radio section.
 - (4) High-frequency air support section.
 - (5) Radio wire integration section.

16-10. Employment

The two command radio companies of the battalion

provide HF radio (fig. 3-7) and multichannel radio communications between the echelons of a field army and from these echelons to major subordinate headquarters (fig. 3-1). HF radio communications from army main and alternate to the corresponding echelons of an adjacent army are also provided. Refer to paragraph 16-11 for the concept of operation. The functions of the elements of a radio company are described in paragraphs 16-11 through 16-23.

Section III. CONCEPT OF OPERATION

16-11. Introduction

The company headquarters is located in the vicinity of the CP it supports. The company headquarters provides command and administrative control and coordination of the company's operational and training mission.

16-12. Company Headquarters

a. *Command.* The company commander receives routine administrative support and direction through normal battalion channels. Operational orders are received and executed as indicated in paragraph 9-20. The commander makes maximum use of company and platoon standing operating procedures for accomplishment of the mission and support activities of the company. This is particularly important in the command radio company because of the dispersement of the company elements. The company commander, however, must insure that he personally visits all operating elements of his company as often as possible.

b. *Administration and Logistics.* The company headquarters conducts its administrative and logistical operations with normal support from comparable activities at battalion level. Company messing facilities are provided by the supported headquarters and by use of five-man cooksets and packaged rations. Supply operations are geared to the heavy volume of repair parts required for the continuous operation of the company's electronic equipment and tactical vehicles.

c. *Coordination.* The single-channel HF radio and multichannel radio facilities provided by the command radio company interconnect with facilities provided by the army command signal operations battalion (TOE 11-95) as well as with facilities provided by the command cable and wire company (TOE 11-78). The company commander, therefore, coordinates not only with the

staff and the operations and intelligence section of his own battalion, but also with all units associated with his company's HF radio and multichannel communications facilities.

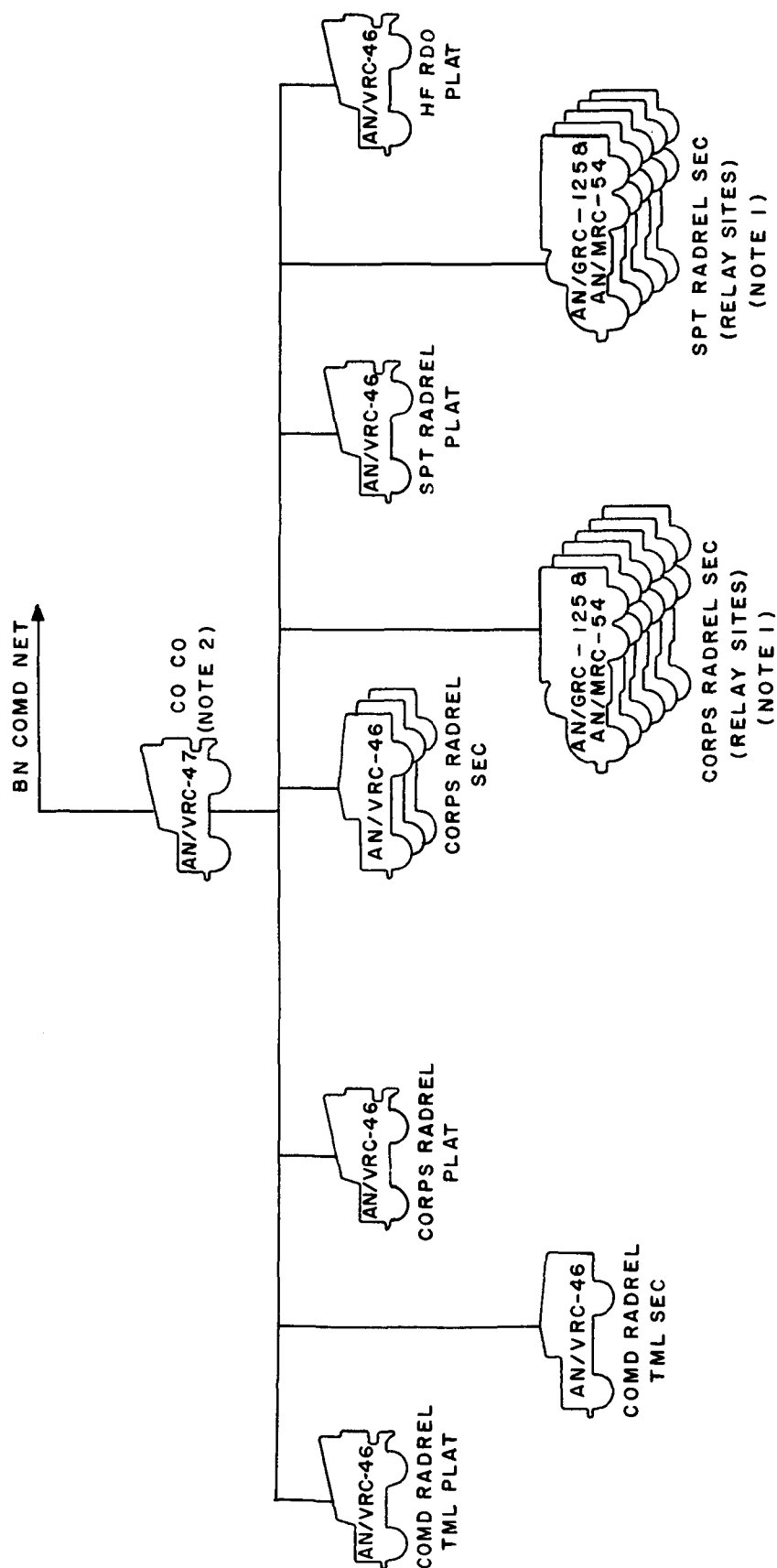
d. *Internal Communications.*

(1) *Radio communications.* The company FM voice net (fig. 16-2) is used by the company commander to maintain command and control of the company and its operational functions. The net is also used during the installation and alignment of the multichannel and HF radio systems of the company. In addition, the company commander may monitor or enter the battalion FM voice net.

(2) *Wire communications.* The company wire net (fig. 16-3) uses a local battery telephone switchboard to terminate company circuits and one or more circuits to higher headquarters.

16-13. Technical Control Section

The company commander is assisted by a facilities control officer within the technical control section to provide for 24-hour officer supervision of the company communications operations. The technical control section, in conjunction with the army command signal operations battalion, provides the personnel and equipment required to exercise technical control over the communications installed and operated by the command radio company. The section is equipped with an operations central shelter and operates on a 24-hour-a-day basis. Technical orders are received directly from the battalion facility controlling signal communications at the supported CP, and the section insures that communications are installed and operated in accordance with these orders. In addition, the section continuously checks the communications operated by the company to insure acceptable quality. The company commander and the technical control officer (facilities control officer) are assisted by the following personnel:



NOTES:

1. THE AN/GRC-125'S INSTALLED IN THE AN/MRC-54 (RADIO REPEATER) CONFIGURATIONS ARE USED FOR INITIAL RADREL SYSTEM LINE-UP, COMMUNICATION WITH ORGANIC BATTALION AIRCRAFT FOR AERIAL RESUPPLY AND FOR ENTRANCE INTO THE COMPANY COMMAND NET IN EMERGENCIES.
2. THE COMPANY COMMANDER OPERATES IN BOTH THE BATTALION NET & THE COMPANY NET AS REQUIRED.

FM 11-125-16-2

Figure 16-2. Type radio company FM-voice net.

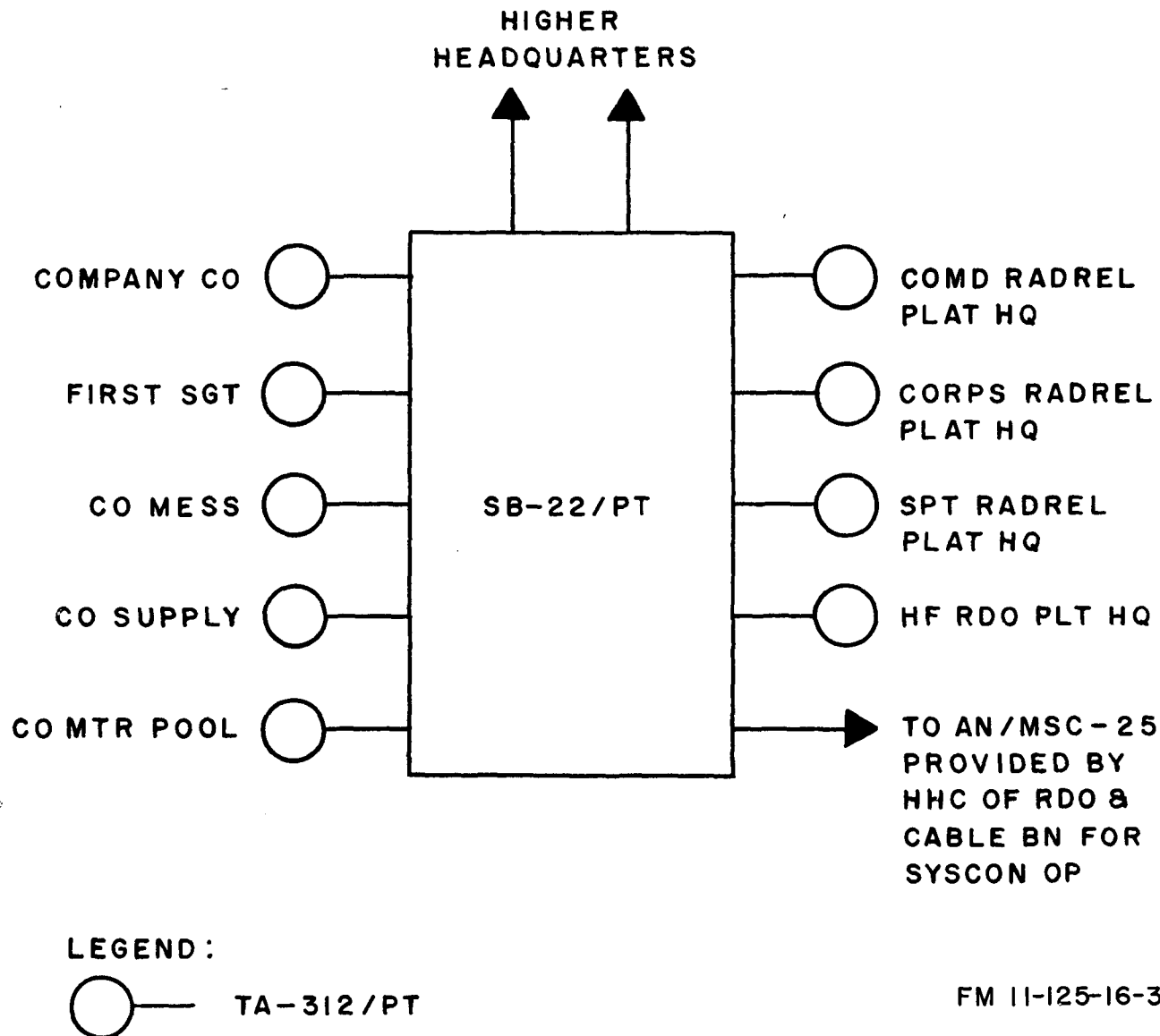


Figure 16-3. Type radio company wire net.

a. An enlisted technical control supervisor who prepares shift schedules, draft copies of circuit diagrams, traffic diagrams, and traffic analysis data; reviews the feeder data required for traffic analysis charts; checks the reports furnished by operation elements; insures that circuit control and allocation information is furnished to the operating elements requiring this information; furnishes the battalion with the current status of signal communications for which the unit is responsible; and supervises all other enlisted personnel in the section.

b. Two circuit control sergeants and six tactical circuit controllers who, on a 24-hour basis,

operate and maintain the two organic communications patching panels in conjunction with the two communications patching panels furnished and operated by the telephone operations company of the army signal operations battalion.

c. Two teletypewriter operators who, on a 24-hour basis, operate and perform operator maintenance on the teletypewriter equipment located in the operations central.

d. A general draftsman who prepares communications diagrams, equipment configuration charts, telephone traffic diagrams, map overlays, layout plans, graphs, and the other charts, visual

aids, and records required by the technical control section for the implementation of directives.

e. Two technical control clerks (facilities control clerks) who, on a 24-hour basis, provide clerical assistance for the operation of the technical control facility.

16-14. Command Radio Relay Terminal Platoon

a. The command radio relay terminal platoon (fig. 16-1) installs, operates, and maintains the multichannel communications equipment located in the vicinity of the army main or alternate CP which it supports. The platoon includes a headquarters section, a command radio relay terminal section, and a command carrier section.

b. The platoon headquarters includes a platoon leader, a platoon sergeant, and a light-truck driver who also operates a voice radio in the company net. The voice radio is used for technical control during installation or displacement of communications systems.

c. The command radio relay terminal section installs, operates, and maintains its seven multichannel radio terminals as required: Normally, these terminals are located on high ground in the vicinity of the army CP being supported and are connected to the multiplexer terminals by cable installed by the command cable and wire company. In addition to supervisory and equipment operating personnel, the section includes an electronic repairman and three powermen who perform on-site equipment maintenance.

d. The command carrier section installs, operates, and maintains its 11 multiplex terminals as required. These terminals usually are located within the perimeter of the army CP being supported and are operated in conjunction with the multichannel radio terminals discussed in c above. The section also provides multiplexer terminals for communications between the radio teletypewriter transmitter and receiver sites and the CP for radio teletypewriter keying lines. In addition to supervisory and operating personnel, the section includes an electronic repairman and two powermen who perform on-site equipment maintenance.

16-15. Corps Radio Relay Platoon

a. A corps radio relay platoon (fig. 16-1) provides the multichannel communications, the terminals at three corps main CPs or three corps alternate CPs, and the multichannel radio repeaters

for these three links. The platoon includes a platoon headquarters and three corps radio relay sections. Each corps radio relay section is responsible for the installation, operation, and maintenance of one multichannel radio repeater, one multichannel radio terminal, and one multiplex terminal employed in the multichannel system to either the main or alternate CP of a corps.

b. The platoon headquarters includes a platoon leader, a platoon sergeant, and light-truck driver who also operates an FM voice radio in the company net. The voice radio is used for technical control during installation or displacement of communications systems.

c. Each of the three corps radio relay sections includes three teams: a radio relay repeater team, a radio relay terminal team, and a multiplexer terminal team. One section operates in each of the three corps areas and, in conjunction with the appropriate section of the command radio relay platoon, establishes a complete multichannel communications link between an army CP (main or alternate) and one of the corps CPs (main or alternate). Normally, each team of a section will be separated from the other elements of the section and from the platoon by distances of approximately 5 to 32 kilometers (km). This separation results in requirements for frequent supervisory visits by the section chief and for close supervision by the team chief at each site.

d. Three electronic repairmen and three powermen are provided for on-site equipment maintenance. One of the powermen may be given the additional duty of driving the $\frac{3}{4}$ -ton truck used by the section chief in supervising his isolated teams and in reconnoitering new sites.

16-16. Support Radio Relay Platoon

a. The support radio relay platoon (fig. 16-1) provides multichannel communications terminals to one army area signal center, to army rear, and to designated major subordinate field army units (other than corps). It also provides the multichannel radio repeaters in the command communications links to those units. Normally, one half of the major subordinate army units are supported by the support radio relay platoon of one command radio company and the other half are supported by the support radio relay platoon of the other command radio company of the battalion.

b. The support radio relay platoon includes a platoon headquarters, a support radio terminal

section, and a support radio relay section. The support radio terminal section operates the multichannel terminals at major field army subordinate headquarters; the support radio relay section operates the multichannel repeaters in the links to those headquarters.

c. The platoon headquarters includes a platoon leader, a platoon sergeant, and a light-truck driver who also operates an FM voice radio in the company net. The voice radio is used for control during installation or displacement of communications systems.

d. The support radio terminal section is organized into six multichannel radio terminal teams. Two of the multichannel radio terminal teams provide a link termination at an army area signal center and a link termination at the supported FASCOM headquarters (main or alternate). The other four terminal teams provide terminals at designated major field army subordinate headquarters. These four radio terminals are equipped to terminate both the main and alternate command systems links to those units.

e. The teams of the section will normally be separated from other teams of the section and from the platoon headquarters. This results in requirements for frequent supervisory visits by the section chief and for close supervision by the team chief at each site.

f. An electronic repairman and two powerman are provided for on-site equipment maintenance.

16-17. Support Radio Relay Section

a. The support radio relay section includes five radio relay repeater teams for extension of army command communications systems to major field army subordinate headquarters (excluding the corps system). The support radio relay section, in conjunction with a like section in the other command radio company of the army command signal radio and cable battalion, provides a repeater capability on 50 percent of the command links to major subordinate field army headquarters.

b. The teams of the section will normally be separated from other teams of the section and from the platoon headquarters. This separation results in requirements for frequent supervisory visits by the section chief and for close supervision by the team chief at each site.

c. An electronic repairman and two powermen are provided for on-site equipment maintenance.

16-18. HF Radio Platoon

a. The HF radio platoon, in conjunction with a similar HF radio platoon in the other command radio company of the army command signal radio and cable battalion, provides the personnel and equipment to operate the radio teletypewriter stations in the six field army command nets, stations in each of the four army air request nets, stations in the SYSCON net, stations in the army-adjacent army liaison net, and the RWI facilities for the field army main and alternate CP.

b. The HF platoon (fig. 16-1) includes a platoon headquarters, an HF CP radio section, a forward radio section, an HF air support section, and an RWI section.

16-19. High Frequency Radio Platoon Headquarters

The platoon headquarters includes a platoon leader, a platoon sergeant, and a light-truck driver who also operates an FM voice radio in the company net. The voice radio is used for control during installation or displacement of communications systems.

16-20. High Frequency Command Post Radio Section

a. The HF CP radio section operates two radio receiving sets (each having multiple receivers) and two radio transmitting sets (each having multiple transmitters) located at either army main or alternate. The equipment located at army main is usually designated as NCS of the six army command radio teletypewriter nets in which they operate. The section also operates a transmit and receive radio teletypewriter set as a subordinate station in the SYSCON net. This station is located at either the army command signal radio and cable battalion headquarters or at the army command signal operations battalion headquarters, as directed. Normally, the stations in the six command nets operated by the section will be located outside the perimeter of the field army main or alternate command post and will therefore be remotored to teletypewriter facilities in the field army tactical operations centers via multichannel cable circuits installed by the command cable and wire company.

b. Personnel authorized within the section include a section chief for overall supervision and a team chief for each radio and teletypewriter equipment configuration. Two field radio repairmen and two powermen are also included for on-site equipment maintenance.

16-21. Forward Area Section

a. The forward area section provides a total of 10 radio teletypewriter teams. Eight of these teams are employed as subordinate stations in army command nets for communications to major subordinate army units and to adjacent or attached units. (Eight additional teams are provided by the other command radio company of the army command signal radio and cable battalion.) The battalion headquarters designates the specific units to be supported by each company. The other two radio teletypewriter teams in the section are employed as terminals of the army-adjacent army liaison nets. (For example, when the company supports the army main CP, it provides the terminal at army main and the terminal at adjacent army main.)

b. The forward radio section includes a section chief for overall supervision and a team chief for each radio and teletypewriter equipment configuration. The section also includes two field radio repairmen, one teletypewriter repairman, and four powermen for on-site equipment maintenance.

16-22. Air Support Section

The air support section provides a station in each of four radio teletypewriter air request nets (fig. 3-7). When the section operates in support of army main, the stations provided by the section are designated as NCS. The section includes a section chief for overall supervision of the section and three team chiefs: one each for the radio teletypewriter receiving equipment team, the radio teletypewriter combined receiving and transmitting equipment team. The section also includes a radio repairman, a teletypewriter repairman, and a powerman for on-site equipment maintenance.

16-23. Radio Wire Integration Section

The RWI section operates on RWI facility at either the main or the alternate field army CP to provide army command and staff personnel a capability of entering the army multichannel communications system using their voice radio sets. The section includes a section chief and two RWI operators, and it provides 24-hour service.

CHAPTER 17

ARMY COMMAND SIGNAL OPERATIONS BATTALION

17-1. Concept of Operations

The army command signal operations battalion (TOE 11-95), in conjunction with the army command signal radio and cable battalion (TOE 11-75), provides the command communications systems for the fragmented headquarters of a field army. The army command signal radio and cable battalion furnishes the multichannel, cable, and high-frequency radio links for the system. The army command signal operations battalion provides the terminal communications facilities at the command signal centers of the fragmented field army headquarters. In addition, the army command signal operations battalion provides air messenger and limited aircraft for air courier service for the fragmented headquarters and major subordinate headquarters of the field army. Normally, the headquarters and headquarters company (minus the army rear signal operations platoon) is located at the main command post with battalion headquarters. One telephone operations company, one communications center company, and elements of the army command signal radio and cable battalion are located at the field army main and alternate command posts. The army rear signal operations platoon is located at the field army rear echelon.

17-2. Mission

The mission of the army command signal operations battalion is:

a. To provide terminal communications facilities (message center, teletypewriter, telephone, facsimile) for the echelons of a field army headquarters.

b. To provide motor messenger and aircraft for limited air courier service for a field army headquarters.

17-3. Assignment and Allocation

a. Assignment. The army command signal operations battalion is organic to an army signal brigade (TOE 11-102 G).

b. Allocation. The army command signal oper-

ations battalion is allocated on the basis of one each to an army signal brigade.

17-4. Capabilities and Limitations

a. Capabilities. At full strength (level 1), this unit is capable of the installation, operation, and maintenance of communications facilities at echelons of a field army headquarters to include—

(1) A communications complex to support the communications requirements of the army main and alternate command post consisting of—

(*a*) Two manual telephone centrals, each capable of terminating 60 manual or dial trunks and 600 local or common battery subscriber circuits.

(*b*) Two secure teletypewriter relay centrals, each capable of providing eight full-duplex circuits with multiple address and automatic numbering features.

(*c*) Four secure teletypewriter terminals, each providing 4 full-duplex teletypewriter circuits and containing message poking and control features.

(*d*) An off-line crypto facility.

(*e*) A message center facility.

(*f*) A motor messenger and dispatching facility.

(*g*) A technical control center for circuit patching and control of terminal communications facilities.

(2) A communications complex, to support a field army tactical operations center (FATOC) (fig. 3-4) consisting of—

(*a*) A manual telephone central office capable of terminating 20 manual or dial trunks and 200 local or common battery subscriber circuits.

(*b*) Three teletypewriter operations centrals, each capable of providing 4 full-duplex or 8 half-duplex teletypewriter circuits for high-precedence traffic.

(*c*) Three teletypewriter terminals, each

capable of providing secure terminal equipment for 3 full-duplex radio teletypewriter circuits.

(d) A facsimile terminal capable of providing operation of four facsimile equipment simultaneously.

(e) A message center section facility to handle FATOC traffic.

(f) A technical control center to control FATOC terminal communications.

(3) Communications facilities at the rear echelon of a field army headquarters (fig. 3-5) to include—

(a) A manual telephone central office capable of terminating 20 manual or dial trunks and 200 local or common battery subscriber circuits.

(b) A teletypewriter terminal capable of providing secure terminal equipment for three full-duplex teletypewriter circuits.

(c) A message center facility capable of providing message handling, off-line crypto, and motor messenger service.

(4) Organic aircraft for air courier and messenger service for a field army headquarters and organic aircraft for the battalion commander and his staff for command and staff visits and area reconnaissance.

(5) Unit administration, religious service; supply and mess facilities; organizational maintenance of weapons, aircraft, avionics equipment, vehicles, and power generators; and direct support level maintenance of organic communications-electronic and cryptographic equipment assigned to the units of the battalion.

(6) Effective, coordinated defense of the unit's area and installations at a reduction of the mission capability.

b. Limitations. This unit depends upon—

(1) The army command signal radio and cable battalion for long-lines systems to include radio relay terminal and repeater facilities for cable battalion for long-lines systems to include radio relay terminal and repeater facilities for interconnecting echelons of a field army headquarters, and for connecting the headquarters of major subordinate headquarters. A mobile radio teletypewriter station for use in the army signal brigade systems control net is also provided when such use is required by the signal operations battalion.

(2) The field army area communications systems for interconnecting echelons of the field

army headquarters to subordinate field army organizations not serviced directly by the long-lines systems provided by the army command signal radio and cable battalion, and for alternate routing facilities to major subordinate organizations as required.

(3) The United States Army Strategic Communications Command (USASTRATCOM) for the entrance facilities into the theater army communications system.

(4) The army signal brigade headquarters for systems control information and photographic services.

(5) Appropriate service organizations in the area for medical, dental, and finance services, and for supplemental transportation.

(6) Appropriate TOE 11-500 (1B, 1E, 1F) teams for additional aircraft when the unit is operating in Southeast Asia or in a similar environment.

17-5. Category and Mobility

a. Category. The battalion is designated as a category II unit (AR 310-25) and is habitually found forward of the field army rear boundary.

b. Mobility. For the mobility of the units organic to this battalion, refer to chapters 18, 19 and 20.

c. Tactical Airlift Operations.

(1) Air Force tactical airlift forces increase the battlefield mobility of the Army in land combat operations. Basically, the Air Force will provide the Army with the capability to air land or airdrop combat elements (combat support) and to provide Army elements with sustained logistical support (combat service support).

(2) Complete details governing joint Army-Air Force doctrine for tactical airlift operations are contained in FM 100-27.

17-6. Organization

The army command signal battalion (fig. 17-1) consists of a headquarters and headquarters company, two telephone operations companies, and two communications center companies.

a. The headquarters and headquarters company is organized to effect the control of the organic companies of the battalion; to direct the installation, operation, and maintenance of the field army communications facilities that are furnished by the battalion; to provide air courier

and air messenger service for the field army headquarters; and to provide signal communications for the rear echelon of the field army headquarters.

b. The two communications center companies provide communications center services for the main and alternate command posts of the field army headquarters.

c. The two telephone operations companies provide telephone communications, technical control, and electrical power to support the missions of the two communications center companies and the two telephone operations companies that are organic to the battalion.

17-7. Control

In addition to the normal command and control activities engaged in by signal brigade commanders (army signal officer) and the battalion commander, systems control facilities are available to each whereby the overall communications system and portions thereof can be timely installed, supervised, operated, and maintained. The systems control and operations section of the army signal brigade (fig. 9-1) plans, engineers, directs, and coordinates the installation and operation of the overall system. The systems control center located at battalion receives orders and instructions pertaining to its portion of the system and passes these orders and instructions to the technical control center which is operated by the telephone operations company of the battalion. Continuous co-

ordination is affected between the systems control facilities of the battalion and those organic to the command signal radio and cable battalion.

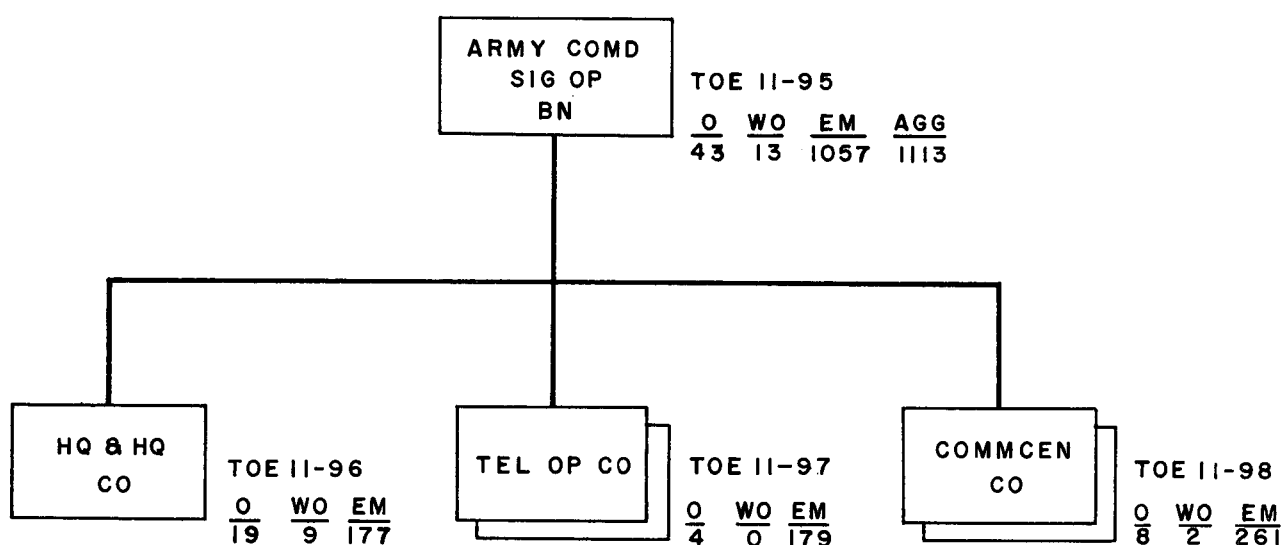
17-8. Displacement

a. The battalion TOE provides personnel and equipment for operations during displacement of army main and army alternate headquarters. Additional personnel and equipment are not provided for concurrent operation at the old and new location during the displacement of the army rear command post.

b. There are several methods of displacing the army main and alternate headquarters. The method selected is a command decision that is based on existing circumstances. Two methods that may be used follow:

(1) Operations close at the old location of army main, and all personnel and equipment are moved as expeditiously as possible to the new command post (CP) location. In this method, army alternate exercises control until army main is ready to assume operations. Army alternate is then closed and moved to its new location, where it again assumes its role of alternate headquarters.

(2) Communications facilities for each element of army headquarters are displaced by echelonment to maintain continuous operations. Minimum facilities are installed in a projected new area to enable the headquarters to begin operations. Facilities are phased out of the old location



FM 11-125-17-1

Figure 17-1. Organization army command signal operations battalion, TOE 11-95G.

and built up in the new location as rapidly as movement of elements of the headquarters will allow until the old location is completely closed out.

c. Army rear CP, normally located in the vicinity of FASCOM main CP, is displaced as described in *b*(2) above, but with a reduction in its communication capability. During the displacement of the army rear CP, support from the army area signal centers in the vicinity of the old and the new CP locations may be required. This support will be provided in accordance with the army signal brigade standing operating procedures (SOP).

17-9. Messenger Service

a. The army command signal operations battalion provides scheduled and special motor messenger service, scheduled and special air messenger service, and aircraft for limited air courier service within the field army headquarters complex and to its major subordinate headquarters. The scheduled messengers depart and return at specified times, making regular stops along a predetermined route. The special messengers augment the scheduled messenger service, provide messenger service to units that are not located on a scheduled messenger route, or deliver high-precedence or bulk traffic in order to relieve the traffic load on electrical means of communication. A courier, usually a warrant officer or commissioned officer furnished by the adjutant general, is responsible for the secure physical transmission and delivery of documents and material. Couriers must be employed for the transmission of TOP SECRET information when it is sent in the clear.

b. The two communications center companies, each having message-handling and message-dispatching facilities provide motor messenger service between the echelons of a field army headquarters and between these headquarters and the headquarters of major subordinate units. Each of the two communications center companies coordinates air messenger service with the aviation section of headquarters and headquarters company. Motor messenger service to the main CP's of major subordinate units is provided by the communications center company at army main, while service to the alternate CP's of major subordinate units is provided by the communications center company at army alternate. Each communications center company is authorized 19 motor messenger teams. The army rear signal operations platoon of headquarters and headquarters company is authorized two motor messenger teams for motor

messenger service for the field army rear CP. Each motor messenger team is assigned one messenger and one assistant messenger. Each team is provided with one 1/4-ton light vehicle and one 1/4-ton trailer. The motor messengers provide a secure and reliable means of communication, and they deliver and pick up low-precedence traffic and charts, maps, overlay, diagrams, photographs, and packages which are too bulky to be sent by other means. Unencrypted classified traffic other than TOP SECRET, may be sent by messenger when the addressee does not have the required cryptographic equipment or when the time required to encrypt and decrypt the message would greatly exceed the messenger delivery time.

c. Air messenger service is provided by the aviation section of headquarters and headquarters company. The aviation section is equipped with fixed-wing aircraft, helicopters, and crews. Additional aircraft and crews are authorized when the battalion is operating in Southeast Asia or in a similar environment. Air messenger service is a swift and additional means of message delivery when motor messengers are delayed by congested road conditions; when trafficability is reduced because of climatic or topographic condition; when vehicles are vulnerable to ambush, mines, or interdiction fire, or when the distances between headquarters are too excessive for delivery of messages by motor messenger. Normally, air messengers will pick up and deliver messages or packages at airfields located in the vicinity of the headquarters served. The vertical landing and takeoff capability of the helicopters and the drop and pickup message techniques used by the fixed wing aircraft may eliminate the use of prepared landing strips in many situations. The battalion aviation officer coordinates the operations of his section with the army signal brigade aviation officer, the communications center company commanders, the Air Weather Service, and the air traffic control facility serving the field army area of operations.

d. The army signal brigade systems control center coordinates the schedules of the air and motor messengers with the various staff sections requiring timely reports. The air and motor messenger schedules are also coordinated with the ACSC-E's of the corps and divisions assigned or attached to the field army, with the commanders of subordinate or adjacent headquarters, and with the battalion commanders of the army area signal centers where messengers pick up or deliver pouched traffic to the designated message

distribution points. Messenger schedules are also published in the messenger section of all unit SOI's concerned with messenger communications. Figure 3-8 shows a type signal motor and air messenger service for a field army. Following are type motor and air messenger schedules:

(1) *Type motor messenger schedule (type field army).*

From	To	Team runs	
		Scheduled	Special
Army Main	Army Rear	2	0
Army Main	Army ALTN	2	1
Army Main	Corps Main (3)	12	6
Army Main	Airstrips (4)	2	0
Army Main	Misc Hq (8)	2	0
Army Main	Adjacent Hq	2	0
		22	7

(2) *Type air messenger schedule (type field army).*

From	To	Airplane-Helicopter	
		Scheduled	Runs Special
Army Main	Rear and ALTN	2	0
Army Main	Corps (3)	12	3
Army Main	Message Distribution		
	Point	2	0
Army Main	Adjacent		
	Field Army	2	2
Army Main	Miscellaneous Hq	2	2
		20	7

CHAPTER 18

HEADQUARTERS AND HEADQUARTERS COMPANY

Section I. INTRODUCTION

18-1. General

The headquarters and headquarters company (TOE 11-96) provides the means by which the battalion commander maintains command, administrative, operational, and logistical control over the companies assigned to the battalion (fig. 17-1).

18-2. Assignment and Allocation

a. Assignment. The headquarters and headquarters company is organic to an army command signal operations battalion (TOE 11-95).

b. Allocation. The headquarters and headquarters company is allocated on the basis of one each to an army command signal operations battalion (TOE 11-95).

18-3. Mission

The mission of the headquarters and headquarters company is to—

a. Direct and coordinate operations of the army command signal operations battalion and to furnish the facilities with which the battalion commander controls the battalion.

b. Provide signal communications for the rear echelon of a field army headquarters.

c. Provide air messenger service and limited aircraft for air courier service for a field army headquarters.

18-4. Capabilities

a. Full Strength (Level 1). At full strength, the headquarters and headquarters company is approximately 80 percent mobile and is capable of providing—

(1) Command and control, staff planning, and supervision of the battalion.

(2) Religious services for the battalion.

(3) Battalion level organizational maintenance of vehicles and power generators organic to the battalion, to include organizational maintenance of weapons, aircraft, avionics equipment,

vehicles, and power generators organic to the headquarters company.

(4) Battalion level administrative, personnel, and supply service.

(5) Mobile direct support level communications-electronics and cryptographic maintenance facilities to supplement the direct support level maintenance provided by the companies organic to the battalion.

(6) Installation, operation, and maintenance of communications facilities required at the rear echelon of a field army headquarters, to include—

(*a*) A manual telephone central office with facilities for interconnecting 200 local telephone subscriber lines and 20 manual or dial trunks.

(*b*) Installation and maintenance of local telephone distribution circuits and local telephones normally required at a rear echelon of a field army headquarters.

(*c*) A secure teletypewriter terminal facility which provides termination for three full-duplex teletypewriter circuits.

(*d*) A message center facility which provides message handling, motor messenger, and off-line cryptographic services.

(*e*) A radio wire integration (RWI) facility to establish signal communications between mobile frequency-modulated (FM) stations and the telephone operations facilities at the rear echelon of a field army headquarters.

(7) Organic aircraft to provide air courier and messenger service for a field army headquarters, and for staff visits and area reconnaissance by the battalion commander and his staff.

b. Reduced Strength. Reduced strength levels 2 and 3 adapt the table of organization and equipment for reduced operational capabilities in digressive 10 percent increments, from approximately 90 percent for level 2 and 80 percent for level 3. Levels 1 through 3 are designed to relate

to the categories established by AR 220-1 and AR 135-8.

18-5. Limitations

This unit depends on—

a. Designated combat service support units for medical and dental services, supplemental transportation, direct support maintenance for avionics and nonsignal items of equipment and supplemental direct support maintenance for communications-electronic equipment.

b. TOE 29-500 (IB, IE, IF) for additional aircraft when operating in Southeast Asia or similar environment.

c. The army command signal radio and cable battalion for high-frequency radio communications support.

d. The army support brigade of the Field Army Support Command (FASCOM) for additional direct and general support maintenance, as required.

Section II. ORGANIZATION AND EMPLOYMENT

18-6. General

The headquarters and headquarters company (fig. 18-1) is organized and equipped under TOE 11-96. The company normally is employed in one echelon and is located at the main CP of a field army headquarters. Certain staff members, however, may operate at specific echelons. The S2 may be located at the alternate CP and the army rear signal operations platoon is located at the army rear CP.

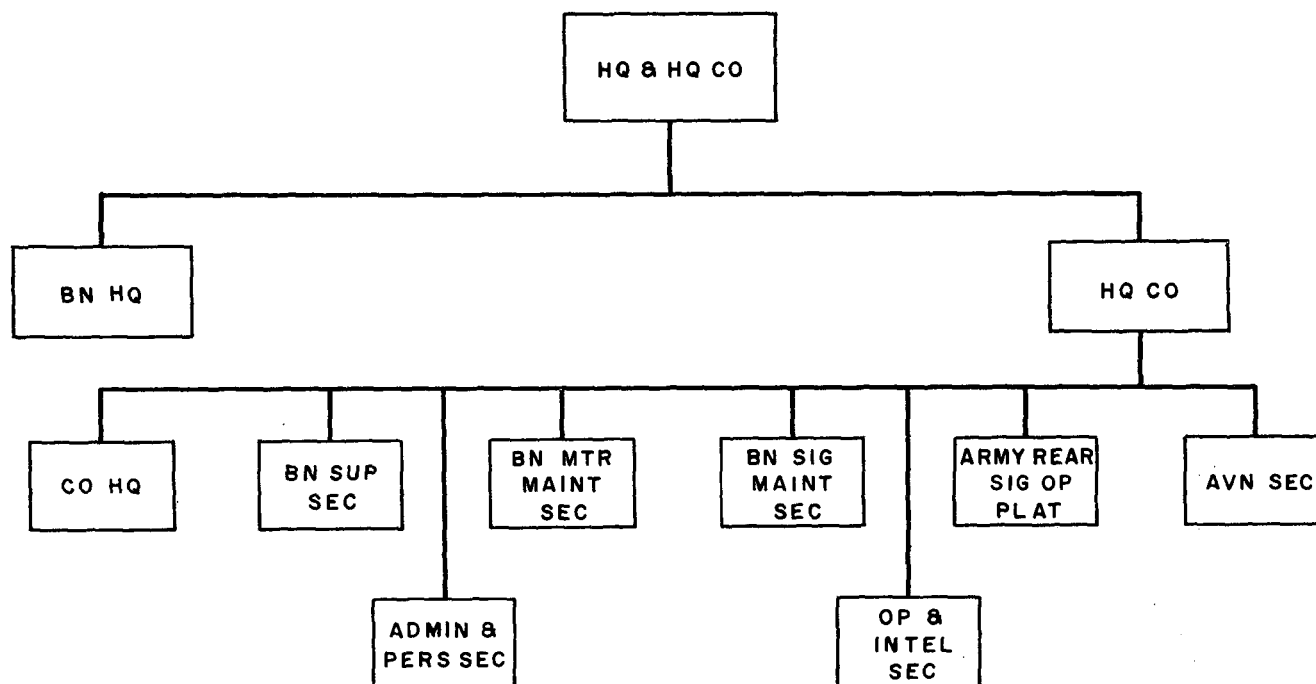
18-7. Organization and Employment

The headquarters and headquarters company

(fig. 18-1) is designated a category II unit (AR 310-25) and is 80 percent mobile. The organization consists of a battalion headquarters and a headquarters company.

18-8. Battalion Headquarters

The battalion headquarters includes the battalion commander, the executive officer, and the staff. The executive officer and the staff assist the commander in exercising command, control, and staff supervision over the operational units of the battalion and insure dissemination and accomplishment of the orders and instructions received from



FM 11-125-18-1

Figure 18-1. Organization headquarters and headquarters company, TOE 11-96G.

the signal brigade commander. Refer to FM 101-5 for further information concerning the duties and responsibilities of the commander and his staff.

18-9. Headquarters Company

The headquarters company includes a company headquarters and seven operating elements.

a. Company Headquarters. The company headquarters contains the personnel and facilities for command and coordination of the training and operational mission. The company headquarters provides technical supervision and overhead personnel for the operation of mess, unit supply, motor maintenance, and weapons maintenance. It also furnishes internal radio and wire communications for the company.

b. Administration and Personnel Section. The administration and personnel section contains the necessary personnel and equipment to provide consolidated administrative and clerical assistance for the battalion to include battalion headquarters, headquarters and headquarters company, and the companies organic to the battalion. This section, under the staff supervision of the S1 who is also the adjutant, conducts its operations in accordance with the policies and procedures established by the S1 of the army signal brigade.

c. Battalion Signal Maintenance Section. The battalion signal maintenance section operates under the staff supervision of the battalion S4. The section is responsible for direct support level maintenance of communications-electronic equipment organic to the battalion. The section normally is divided into two repair facilities for the support of one telephone operations company and one communications center company located at the main and alternate CP of the field army headquarters, respectively. Further information on battalion maintenance procedures is contained in chapter 7.

d. Battalion Motor Maintenance Section. The battalion motor maintenance section operates under the staff supervision of the battalion motor officer. This section supervises the organizational maintenance of motor vehicles and power generating equipment used throughout the battalion, and supplements, at battalion level, the organizational capabilities of the companies. When feasible, equipments that require repair are brought to battalion motor maintenance facility to take advantage of the centralized shop capability. Disabled vehicles may be recovered by use of the section's 5-ton wrecker or a wrecker of one of the

organic companies. This section performs onsite maintenance of vehicles and power equipments.

e. Operations and Intelligence Section. The operations and intelligence section, under the supervision of the S3, provides the commander with the necessary personnel and equipment to support the battalion's operational and training mission. The assistant S3 also performs the additional duties of the battalion S2. In addition to his other duties, the assistant S3 may be located at the army alternate CP where he may be responsible for the supervision and operation of the command signal center. The operations and intelligence section is responsible for the operation of the battalion systems control center. This center processes orders and instructions received from the systems control center at brigade and passes them on to the battalion alternate systems control center, to the technical control center of the collocated organic telephone company, and to the collocated systems control facility of the command signal radio and cable battalion. Refer to figure 13-3 for a systems control diagram.

f. Army Rear Signal Operations Platoon. The army rear signal operations platoon is located at and is specifically organized and equipped to install, operate, and maintain the communications center and radio wire integration facilities for the rear echelon of a field army headquarters (fig. 3-5). This platoon (fig. 18-2) has a platoon headquarters, a communications center section, a telephone section, and a radio wire integration section ((1) through (4) below).

(1) *Platoon headquarters.* The platoon headquarters provides the personnel and facilities to command and coordinate the operating elements of the platoon. The platoon leader, assisted by the platoon sergeant, commands the platoon and coordinates the platoon activities with the battalion S3. He is also responsible for the installation, operation, and maintenance of the communications center, telephone switchboard, and radio wire integration facilities at the army rear headquarters. A light-vehicle driver operates the vehicle and radio assigned to the platoon headquarters and, when required, performs the duties of a wireman.

(2) *Communications center section.* The communications center section provides communications center facilities to include message center, cryptographic, and teletypewriter terminal facilities, and motor messenger service for army rear headquarters.

(3) *Telephone section.* The telephone section

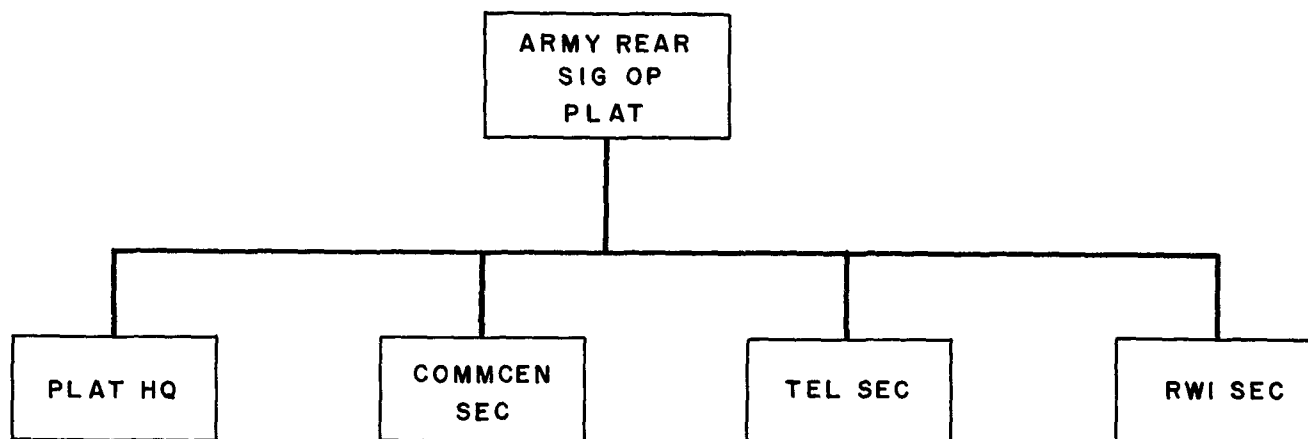
installs, operates, and maintains the local telephone distribution circuits and locals associated with army rear headquarters operations. Telephone switchboard operators and manual central office repairmen are organized in shifts for installation and 24-hour operation and maintenance of the manual central office. Technical control personnel similarly operate and maintain the communications patching central, as a technical control facility, on a 24-hour basis. A wire team installs and maintains the wire and cable circuits and local telephones provided by the platoon. The telephone officer serves as the section chief and coordinates the technical control activities with representatives from the command signal radio and cable battalion.

(4) *Radio wire integration section.* The radio wire integration section is responsible for the installation and operation of a communications system between mobile FM radio stations and telephone subscribers connected to the communications of field army rear headquarters.

18-10. Communications

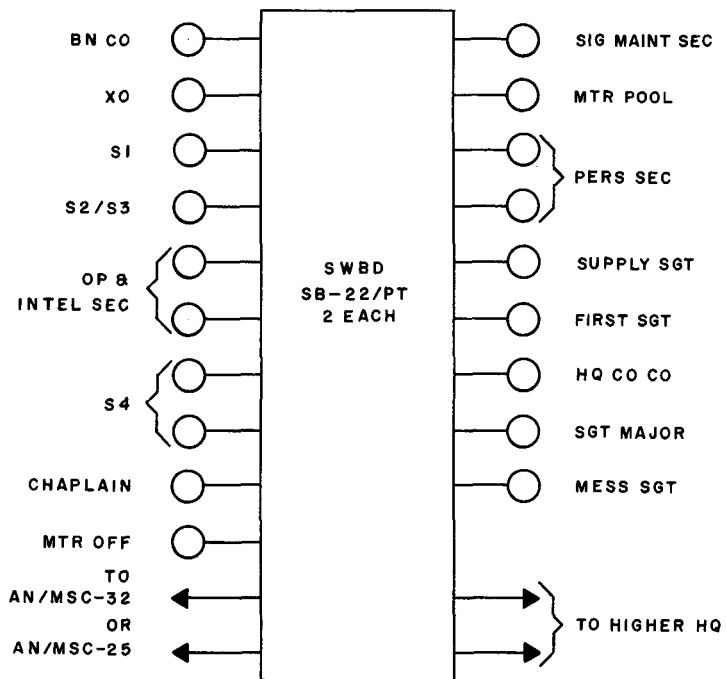
a. Wire Communications. Internal wire communications for the headquarters and headquarters company (fig. 18-3) are provided by the company headquarters. Two switchboards, sufficient cable, and sufficient telephones are authorized for the internal wire net. The command signal radio and cable battalion furnishes support for the laying of long local or trunk circuits.

b. Radio Communications. The headquarters and headquarters company is authorized seven voice radios for internal radio communication. A type battalion command radio net is shown in figure 18-4. The two telephone operations companies and the two communications center companies have one radio set each for communicating in this net. In addition, one HF radio teletypewriter set is furnished by the command signal radio and cable battalion for communicating in the army signal brigade SYSCON net. A radio receiver is installed in each of the two operations centrals to monitor the emergency warning broadcast net of the field army.



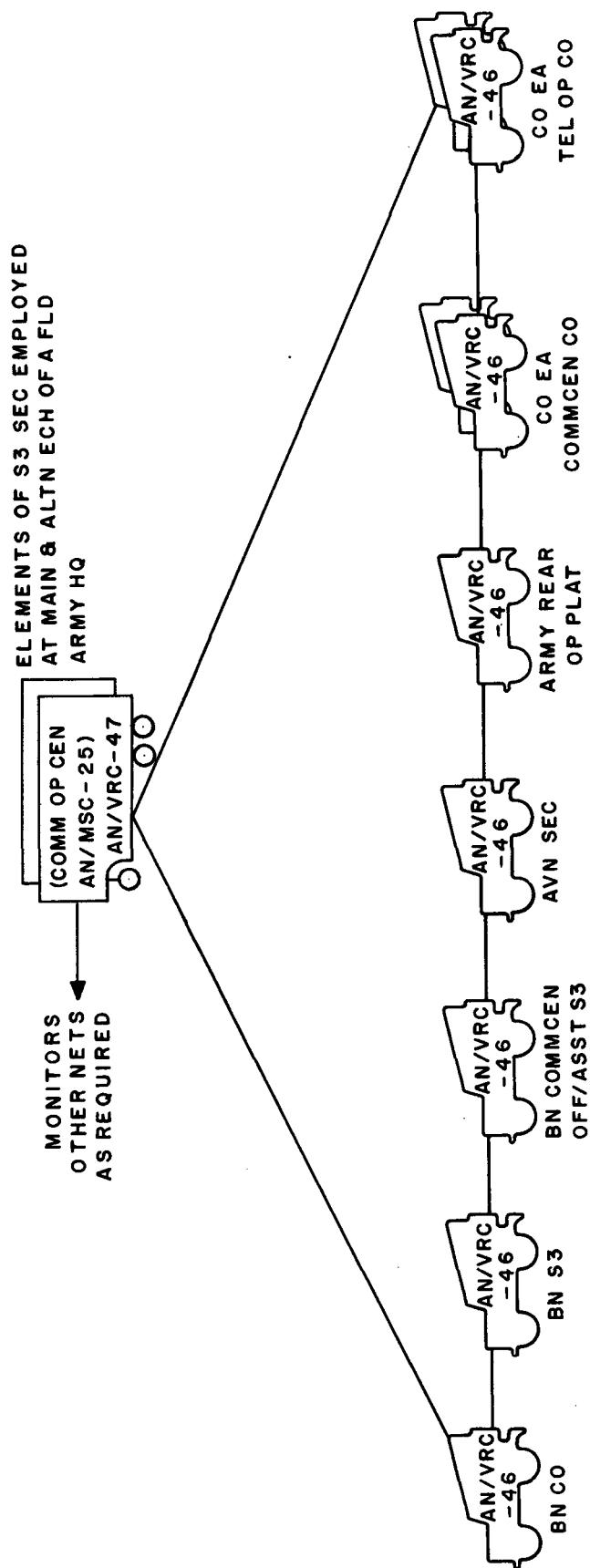
FM 11-125-18-2

Figure 18-2. Army rear signal operations platoon.



FM 11-125-18-3

Figure 18-3. Type army command signal operations battalion internal wire net.



FM 11-125-18-4

Figure 18-4. Type internal FM radio net, army command signal operations battalion.

CHAPTER 19

TELEPHONE OPERATIONS COMPANY

Section I. INTRODUCTION

19-1. General

The telephone operations company, TOE 11-97, is organized and equipped to establish, operate, and maintain telephone communications at the main or alternate echelon of a field army headquarters. The company is designated as a category II unit (AR 310-25), is 85 percent mobile, and is allocated and assigned on the basis of *two* each to an army command signal operations battalion, TOE 11-95.

19-2. Location

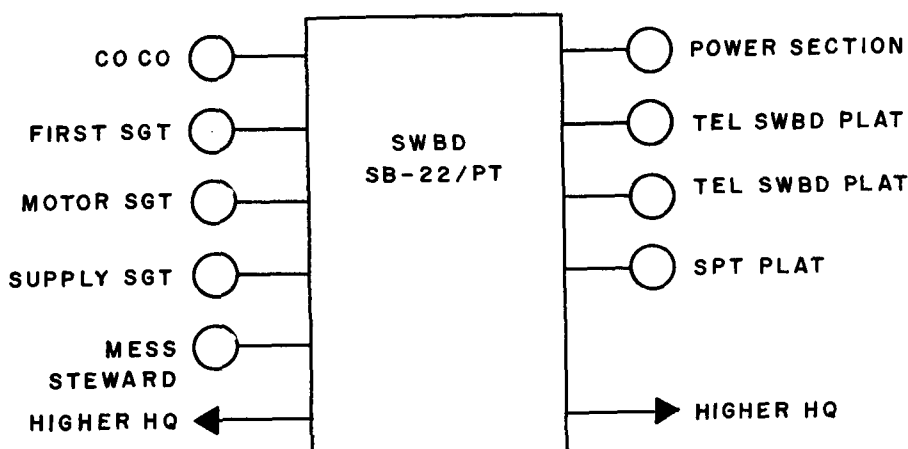
The telephone operations company normally is employed in one echelon. One company is located at the main echelon, and one company is located

at the alternate echelon of a field army headquarters.

19-3. Communications

a. Wire. Each telephone operations company has a local battery switchboard and sufficient wire and telephones to establish internal wire communications for the company (fig. 19-1). One trunk circuit is installed from the company headquarters to army main or alternate CP, and one trunk may be installed to battalion headquarters when feasible.

b. Radio. Each telephone operations company is authorized one FM voice radio set to be used by the company commander in the battalion command radio net (fig. 18-4).



FM 11-125-19-1

Figure 19-1. Type internal wire communications net, telephone operations company.

Section II. EMPLOYMENT AND ORGANIZATION

19-4. General

Each telephone operations company includes the technical control facilities, telephone communications facilities, and power generating units to support the missions of one telephone operations company and one communications center company employed at either the main or alternate CP of a field army.

19-5. Capabilities and Limitations

a. At full strength, the telephone operations company provides the following capabilities:

(1) Installs, operates, and maintains the following at the army main or alternate echelon of a field army headquarters:

(a) Two manual telephone central offices, each providing facilities for interconnecting 600 local telephone subscriber lines and 60 manual or dial trunks to be employed as required.

(b) One manual telephone central office with facilities for interconnecting 200 local telephone subscriber and 20 manual or dial trunks to be employed at a field army tactical operations center.

(c) Two communication patching panels, each providing circuit patching and control of terminal communication facilities.

(d) Fourteen 45 kw power generators to support communication facilities established by a telephone operations company and a communications center company organic to an army command signal operations battalion.

(2) Installs and maintains local telephone circuits and local telephones normally required at an army main or alternate echelon of a field army headquarters.

(3) Performs direct support level maintenance or organic signal equipment.

(4) Performs organizational maintenance on organic weapons, power generators, and vehicles.

b. At reduced strength level 2 or 3, the operational capabilities digress in 10 percent increments, from approximately 90 percent for level 2 to 80 percent for level 3.

c. This unit depends upon—

(1) The army command signal radio and cable battalion (TOE 11-75) for trunking facilities (both multichannel and field wire and cable) from the echelons of a field army headquarters (main or alternate) to designated major subordinate units, and for installation of long local wire

circuits to units in the vicinity of a field army headquarters.

(2) The headquarters and headquarters company for consolidated personnel administration; supplemental organizational maintenance of power generators and motor vehicles; supplemental direct support level maintenance of communications-electronics equipment; and for religious services.

(3) Designated combat service support units for medical and dental services; supplemental transportation direct support; maintenance for motor vehicles, power generators, and other non-signal items of equipment.

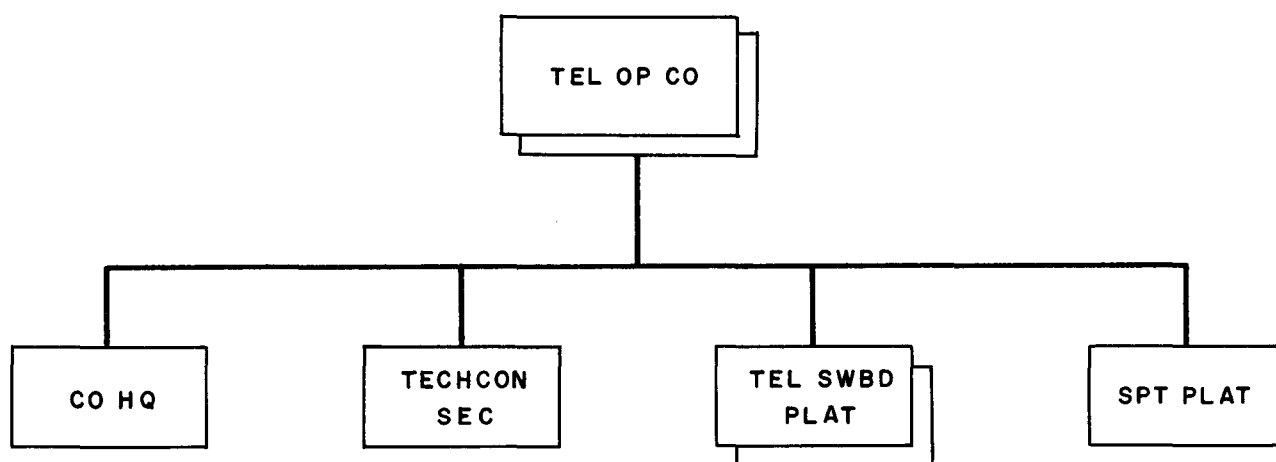
19-6. Organization

Each telephone operations company is organized into a company headquarters, a technical control section, two telephone switchboard platoons, and a support platoon (fig. 19-2).

a. *Company Headquarters.* The company headquarters includes the command element along with administrative, supply, mess, and motor personnel which the company commander needs to be able to command and control his unit effectively. Organizational maintenance of organic weapons and vehicles is also provided by the company headquarters.

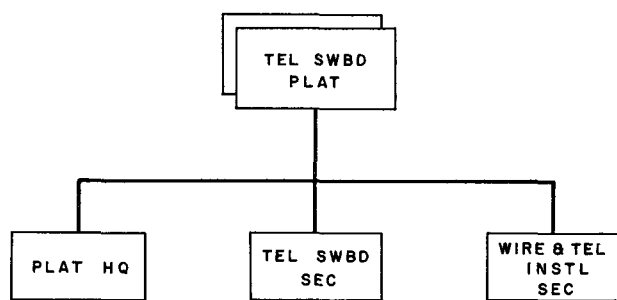
b. *Technical Control Section.* The technical control section is under the operational control of the battalion S3. This section provides the personnel and equipment for the installation, operation, and maintenance of two communications patching panels (SB 675), and is responsible for implementing operational directives received from the battalion systems control as pertains to the communications facilities controlled by these patching panels. Technical control operations are directed from the section's communications operation central. A typical representation of the employment of patching centrals appears in figure 13-3.

c. *Telephone Switchboard Platoon.* There are two telephone switchboard platoons (fig. 19-3) in each telephone operations company. Each platoon is organized into a platoon headquarters, a telephone switchboard section, and a wire and telephone installation section. Each platoon installs, operates, and maintains one manual telephone central office and installs and maintains the local telephone distribution circuits and local subscriber telephones required at the main or alternate echelon of a field army headquarters.



FM 11-125-19-2

Figure 19-2. Telephone operations company.



FM 11-125-19-3

Figure 19-3. Telephone switchboard platoon.

(1) *Platoon headquarters.* The platoon headquarters includes the platoon leader, the platoon sergeant, and a light vehicle driver. The platoon sergeant assists the platoon leader and coordinates the platoon's activities with the technical control section of the command radio company by furnishing feeder data for traffic diagrams, trunk circuit numbering charts, and trunk availability information.

(2) *Telephone switchboard section.* The telephone switchboard section installs, operates, and maintains the Manual Telephone Central Office AN/MTC-9 which consists of two major components; one Telephone Terminal Group AN/MTA-5 containing the telephone main distribution frame and associated equipment; and one telephone switching group AN/MTA-7. Each supervisor works an 8-hour shift with the switchboard operators on duty. The supervisors provide

the operators with traffic diagrams to assist them in routing and rerouting calls. They also assist the operators in handling difficult calls, and furnish information to subscribers who are authorized to receive it.

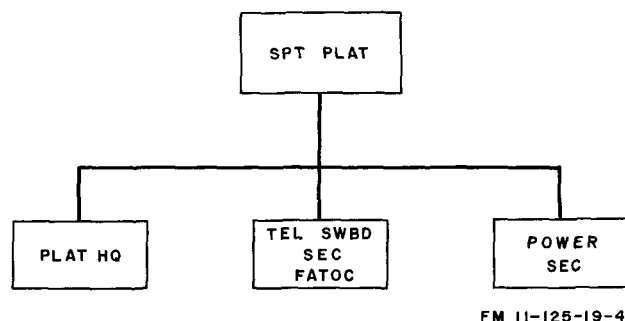
(3) *Wire and telephone installation section.* The telephone installation section installs and maintains the local telephone distribution circuits and local telephones normally required at the army main or alternate echelon or fragmented portions of these echelons of a field army headquarters.

(a) *Section chief.* The section chief supervises the overall mission of the section and is responsible to the telephone switchboard platoon leader for installation and repair assignments performed by the section. He organizes and coordinates all wire team assignments in accordance with instructions received from the platoon headquarters.

(b) *Wire teams.* There are three wire teams to each platoon. Each team consists of one wire team chief, one senior wireman, two wiremen, and two telephone installers. These teams install and maintain the local telephone distribution circuits and local telephones at an army main or alternate echelon and fragmented portions of these echelons.

d. *Support Platoon.* The support platoon installs, operates, and maintains the Manual Telephone Central Office (AN/MTC-1) required at a field army tactical operations center, and installs and maintains the local telephone distribution

circuits and local telephones associated with FATOC operations. In addition, this platoon provides electrical power for terminal communication facilities established by the telephone operations company and the communications center company. The platoon is organized into a platoon headquarters, a telephone switchboard section (FATOC), and a power section (fig. 19-4).



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Figure 19-4. Support platoon.

(1) *Support platoon headquarters.* The platoon headquarters contains personnel and equipment for command and control of the platoon activities. The platoon leader insures that communications equipment organic to the platoon is operational and is manned on a 24-hour basis. The platoon leader is assisted by the platoon sergeant, and a light vehicle operator is assigned to operate the $\frac{1}{4}$ -ton vehicle assigned to the platoon headquarters and to perform the duties of wireman when required.

(2) *Telephone switchboard section (FATOC).* The telephone switchboard section installs, operates, and maintains the Manual Telephone Central Office AN/MTC-1 required at the field army tactical operations center, and installs and maintains the local telephone distribution circuits and local telephones associated with FATOC operations.

(a) The section chief is responsible to the

support platoon leader for the efficient operation of the telephone switching group (AN/MTA-3) which is a component of the AN/MTC-1. He schedules and supervises the operators of the switchboard and provides them with traffic diagrams. He assists the operators in handling difficult calls and furnishes information to those authorized to receive it. Twelve switchboard operators are required for the 24-hour operation of the manual telephone central office switchboard installed in the AN/MTA-3.

(b) One senior manual central office repairman and 1 manual central office repairman perform 24-hour direct support level signal maintenance on the AN/MTC-1 organic to the section.

(c) One wire team chief, one senior wireman, two wiremen, and two telephone installers install and maintain the local telephone distribution circuits and local telephones associated with FATOC operations.

(3) *Power section.* Continuous electrical power is furnished at the main or alternate CP for terminal communications facilities established by the telephone operations company and the communications center company located at these CP's.

(a) *Section chief.* The section chief is responsible to the platoon leader for the overall efficient operation of the section.

(b) *Senior precise power generator or specialist.* This specialist assists the section chief in the supervision, maintenance, and operational activities of the section. Two precise power generator repairmen and seven power generator operators provide 24-hour on-site operational attendance and organizational maintenance of seven 45-kw diesel precise power generator sets PU-407/M and 7-kw diesel precise power generator sets PU-408/M organic to the section. Seven of the required powermen drive the heavy trucks that transport the truck-mounted PU-408's and tow the trailer-mounted PU-407's.

CHAPTER 20

COMMUNICATIONS CENTER COMPANY

Section I. INTRODUCTION

20-1. General

The communications center company (TOE 11-98) is organized to provide communications center facilities for the army main or alternate echelon of a field army headquarters. The company is a category II unit (AR 310-25), is 85 per cent mobile, and is allocated and assigned on the basis of two each to an army command signal operations battalion (TOE 11-95).

20-2. Location

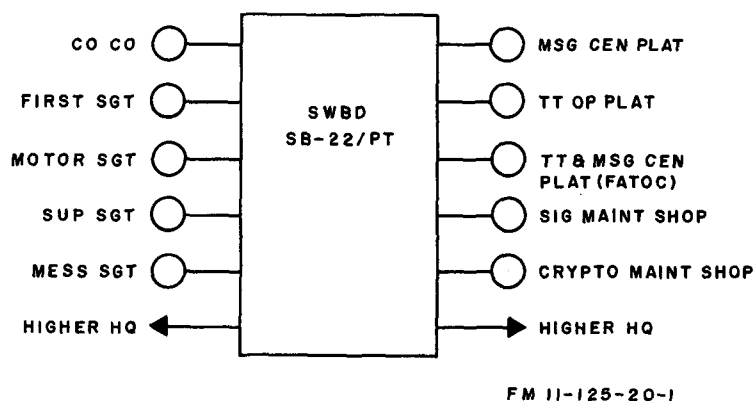
The communications center operations company normally is employed in one echelon. One company normally is located at the main echelon and

one company is located at the alternate echelon of a field army headquarters.

20-3. Communications

a. Wire. The communications center company has one local battery switchboard and sufficient telephones to establish internal telephone communications. Facilities are available for the establishment of trunk circuits to battalion headquarters or other switchboards as required (fig. 20-1).

b. Radio. One FM radio is authorized for use in the battalion command net (fig. 18-4).



FM 11-125-20-1

Figure 20-1. Type internal wire communications net, communications center company.

Section II. ORGANIZATION AND EMPLOYMENT

20-4. General

Each communications center company furnishes the communications center facilities at the army main or alternate echelon of a field army headquarters.

20-5. Capabilities and Limitations

a. Full Strength (Level 1). At full strength, this unit has the following capabilities:

(1) Installs, operates, and maintains communication center facilities at the army main or

alternate echelon of a field army headquarters to include—

(a) Message handling facilities and offline cryptographic services.

(b) A secure tape relay facility which provides terminations for 16 full-duplex teletypewriter circuits.

(c) A secure teletypewriter terminal facility which provides terminations for 16 full-duplex teletypewriter circuits.

(d) Nineteen motor messenger teams for delivery of bulk traffic within the army headquarters complex and to its subordinate headquarters.

(2) Installs, operates, and maintains communications center facilities at a field army main or alternate tactical operations center (FATOC) to include—

(a) A message handling facility.

(b) A secure teletypewriter terminal facility which provides terminations for 12 full-duplex circuits for high precedence traffic.

(c) A remote secure teletypewriter terminal facility which provides terminations for nine full-duplex radio teletypewriter circuits.

(d) A facsimile facility which provides termination for four facsimile circuits.

(3) Provides unit administration, supply and mess facilities, and organizational maintenance of organic weapons, vehicles, and power equipment.

(4) Performs direct support level maintenance on organic signal equipment.

(5) Provides direct support level maintenance of cryptographic equipment organic to the battalion.

b. *Reduced Strength.* At reduced strength level 2 and 3, the operational capabilities decrease in 10 percent increments, from approximately 90 percent for level 2 to 80 percent for level 3.

c. *Limitations.* The company depends upon—

(1) Appropriate units in the area for medical and dental services, and supplemental transportation.

(2) The headquarters and headquarters company for consolidated personnel administration; supplemental organizational maintenance for power generators and motor vehicles; and supplemental direct support level maintenance of communications-electronics equipment; and religious services.

(3) The command cable and wire company, army command signal radio and cable battalion (TOE 11-78) for supplemental cable and wire support.

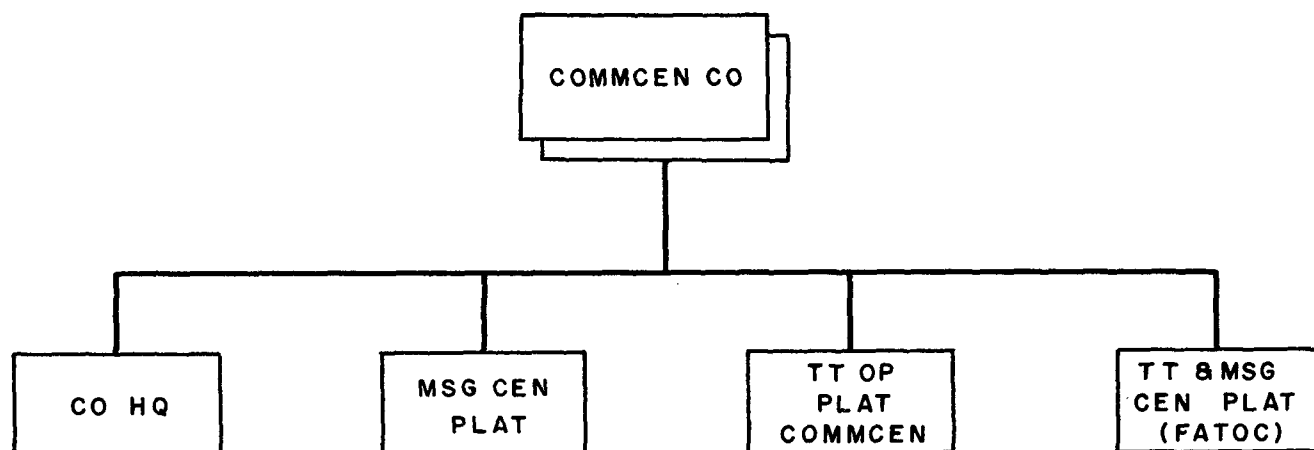
(4) The telephone operations company for electrical power support.

(5) The U.S. Air Force to provide air weather service (AWS) teams to support FATOC and U.S. Army airfields supporting the main or alternate echelon of field army headquarters (AR 115-10).

20-6. Organization

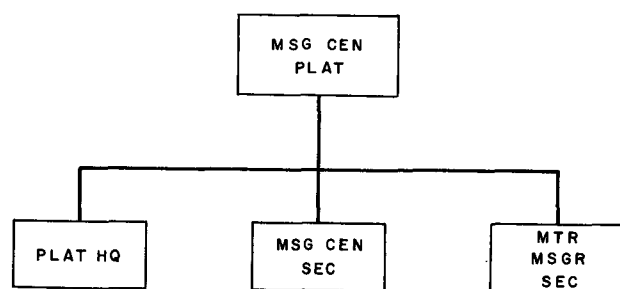
Each communications center company is organized into a company headquarters, a message center platoon, a teletypewriter operations platoon-communication center, and a teletypewriter and message center platoon (FATOC) (fig. 20-2).

a. *Company Headquarters.* The company head-



FM 11-125-20-2

Figure 20-2. Communications center company.



FM 11-125-20-3

Figure 20-3. Message center platoon.

quarters includes the command element along with administrative, supply, mess, and motor personnel which the company commander uses for the effective command and control of his unit. Organizational maintenance of organic weapons and vehicles is also provided by the company headquarters.

b. Message Center Platoon. The message center platoon consists of a platoon headquarters, a message center section, and a motor messenger section (fig. 20-3).

(1) *Platoon headquarters.* The platoon headquarters contains the personnel and equipment for command and control of the activities of the message center section and the motor messenger section. The platoon leader, assisted by the platoon sergeant, insures that the message center is manned and in operation 24 hours a day. He is also responsible for cryptographic security within the platoon and acts as the cryptographic security officer for the company.

(2) *Message center section.* The message center section is organized and equipped to provide a 24-hour message handling and processing service. Two message center shelters provide the necessary working space, equipment, and supplies for sustained operations. The two shelters are located as close as possible to the teletypewriter terminals so that traffic between them may be expeditiously handled (fig. 20-4). A third shelter is used to house the off-line cryptographic equipment and supplies. This shelter is also located in the same secure area as the other two shelters.

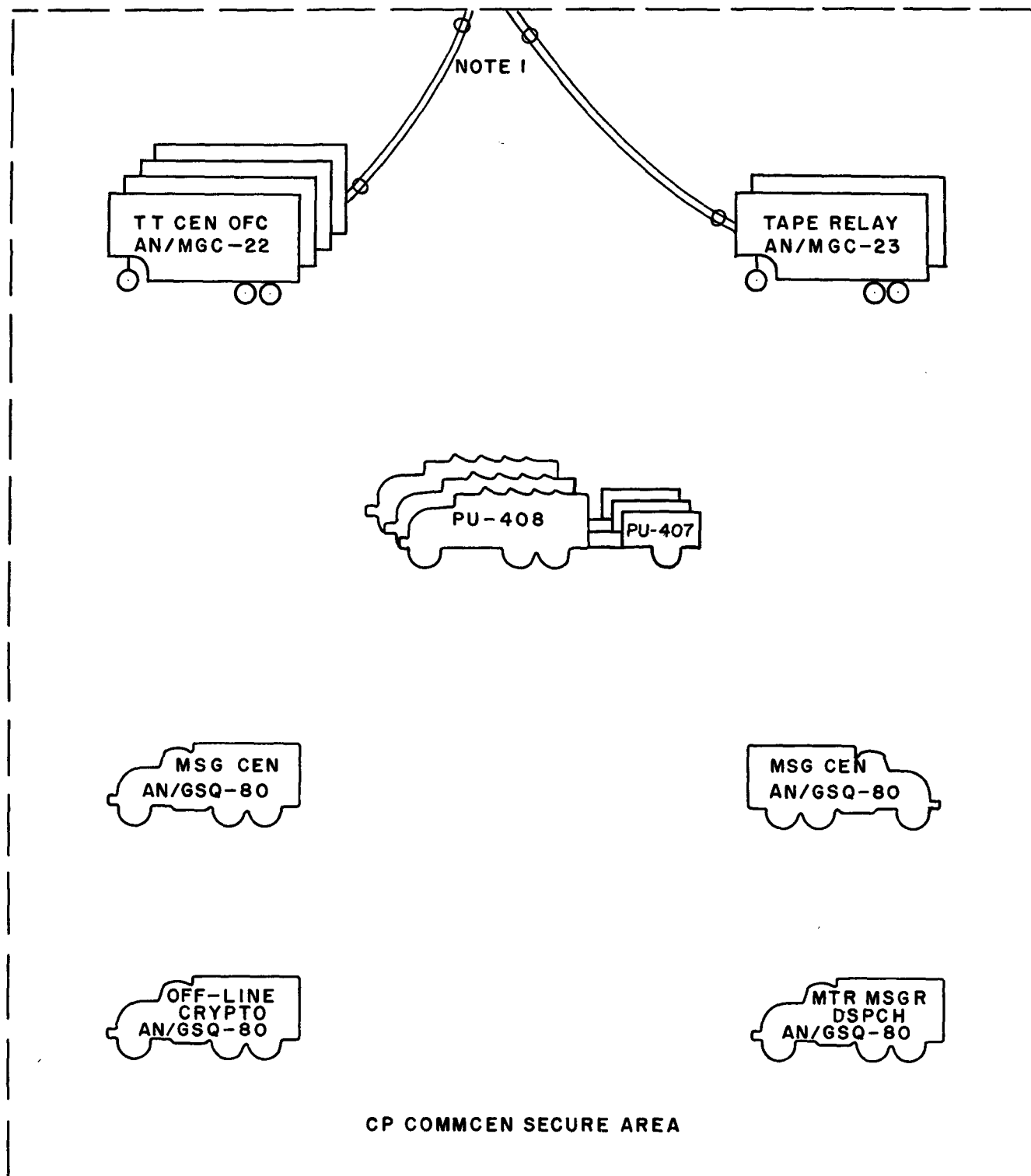
(3) *Motor messenger section.* The motor messenger section provides the personnel and facilities for establishing and maintaining the special and scheduled motor messenger service for the main or alternate echelon of a field army headquarters. This service provides the most expeditious and economical means for handling the

large amounts of bulk traffic normally associated with a headquarters of this size and type. The section chief is responsible for the coordination and efficient operation of the scheduled and motor messenger service. Two messenger dispatchers are required to provide 24-hour dispatch service for the 19 motor messenger teams assigned to the section. One messenger center shelter which is also located in the communications center secure area (fig. 20-4), provides working space and shelter for the messenger dispatch service.

c. Teletypewriter Operations Platoon (COMM-CEN). The teletypewriter operations platoon (COMM-CEN) consists of a platoon headquarters, one tape relay section, and two teletypewriter terminal sections (fig. 20-5).

(1) *Platoon headquarters.* The platoon headquarters contains the personnel and facilities for command and control of the activities of the tape relay section and the two teletypewriter terminal sections. The platoon provides tape relay and teletypewriter terminal facilities for either a main or alternate echelon of a field army headquarters. The platoon leader must insure that the communications equipment is operationally manned and maintained 24 hours a day. The platoon sergeant assists the platoon leader by coordinating the teletypewriter requirements with the technical control facility located at the supported echelon. The light-truck driver operates the ¼-ton vehicle assigned to the platoon headquarters, and he is also used as a teletypewriter operator in the teletypewriter terminal or tape relay facility as required.

(2) *Tape relay section.* The tape relay section installs, operates, and maintains two tape relay facilities (fig. 6-4) on a 24-hour basis. The section is responsible for relaying incoming teletypewriter traffic and for providing termination for 16 secure full-duplex circuits to handle traffic. A minor tape relay station is at either the main or alternate CP of the field army. These minor tape relay stations are so designated to insure that traffic not specifically intended for them is kept in the area communications portion of the field army tape relay system. In addition to the minor tape relay stations at army main and alternate CP's, army rear operates a tributary station in the system as required. The tape relay and terminal stations normally are positioned within 26 pair cabling distances from each other and the patching panel (fig. 20-4). The section leader, assisted by the teletypewriter supervisor, is responsible for the efficient operation of the secure tape relay facilities. The teletypewriter supervi-

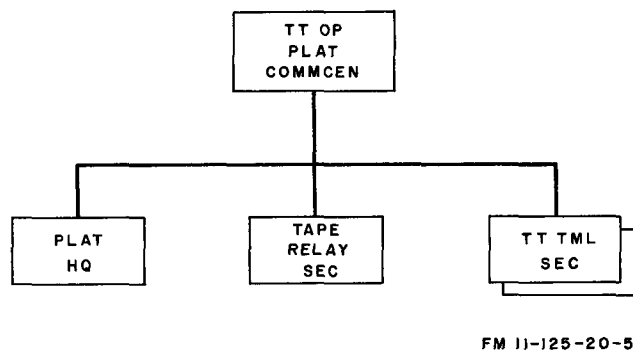


NOTE:

1.26-PAIR CABLE CONNECTS TO
SB-675 FURNISHED BY A RADIO
CO, TOE 11-77.

FM 11-125-20-4

Figure 20-4. Type signal equipment configuration.



FM 11-125-20-5

Figure 20-5. Teletypewriter operations platoon (COMM-CEN).

sor prepares shift schedules, coordinates the efforts of the four shift supervisors, and insures that operating procedures are maintained.

(3) *Teletypewriter terminal section.* There are two teletypewriter terminal sections in the teletypewriter operations platoon (COMM-CEN). Each section installs, operates, and maintains two teletypewriter terminal facilities for an echelon of a field army headquarters (fig. 20-4). The section leader is responsible for the efficient operation of the communication equipment configurations organic to the section. The section chief assists the section leader by preparing shift schedules and insuring that the two teletypewriter terminals are adequately manned. He also coordinates the efforts of the shift supervisors and insures that security standards and standing operating procedures are maintained and followed.

d. *Teletypewriter and Message Center Platoon (FATOC).* The teletypewriter and message center platoon (FATOC) consists of a platoon headquarters, a teletypewriter operations section, and a message center section (fig. 20-6).

(1) *Platoon headquarters.* The platoon headquarters includes the personnel and equipment for the command and control of the activities of the platoon. The platoon leader, assisted by the platoon sergeant, insures that the communications equipment organic to the platoon is operational and is manned 24 hours a day. The platoon sergeant coordinates the teletypewriter circuit requirements with the technical control facilities operated at the supported echelon. Two powermen are assigned to perform organizational maintenance on the power generators organic to the platoon. One powerman will be assigned the additional duty of operating the 1/4-ton light vehicle that is assigned to the platoon.

(2) *Teletypewriter operations section.* The teletypewriter operations section installs, operates, and maintains the teletypewriter terminals for the point-to-point teletypewriter circuits for the field army tactical operations center.

(a) *Section leader.* The section leader is responsible for the coordination and efficient operation of three teletypewriter operations centrals that are capable of providing eight half-duplex or four full-duplex channels and three teletypewriter operations centrals each capable of providing six secure half-duplex or three secure full-duplex operating channels for multichannel and HF radio teletypewriters operations between the FATOC and major subordinate headquarters and the tactical operations centers of these headquarters. Figure 3-4 depicts a type configuration and the nomenclature of the teletypewriter operations centrals used at the FATOC of the field army main or alternate command post.

(b) *Teletypewriter supervisor.* The teletypewriter supervisor is the chief NCO. He assists the section leader in all phases of the operation of the section.

(c) *Teletypewriter shift supervisor.* A total of eight shift supervisors are required for the continuous supervision of the six teletypewriter terminal facilities. Six shift supervisors are required for the supervision of the three teletypewriter operations centrals (AN/MGC-32) and two shift supervisors are required for the three collocated teletypewriter terminals (AN/MS-29).

(d) *Teletypewriter operators.* Forty-five operators are required for the operation of the teletypewriter equipment installed in the six teletypewriter terminal facilities. Ten operators are required for the operation of the AN/MS-29.

(e) *Teletypewriter equipment repairmen.* One senior teletypewriter equipment repairman and two teletypewriter repairmen perform direct support level maintenance on the organic teletypewriter equipment to insure 24-hour operation.

(3) *Message center section.* The message center section provides message handling, off-line crypto, motor messenger service, and facsimile facilities at an echelon of a field army headquarters for FATOC operations. Air weather service personnel are provided by the United States Air Force.

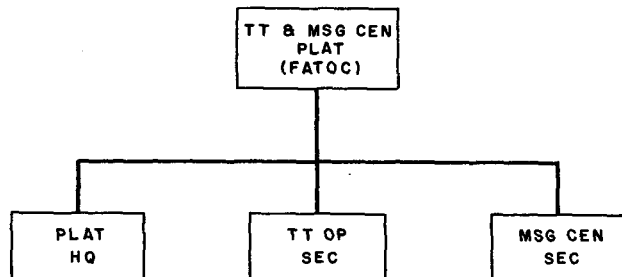
(a) *Section chief.* The section chief supervises the activities of the message center personnel who operate in the message center shelter and in the facsimile shelter (fig. 3-4). He is responsible to the platoon leader for the coordina-

tion and control of the operational mission of the section.

(b) *Signal message center supervisor.* The message center supervisor is responsible to the section chief for the efficient and secure operation of the message center to include the supervision of the facsimile operations.

(c) *Other enlisted personnel.* A communications center specialist and a communications center clerk perform the message handling and processing services and the off-line crypto operations. Two 2-man motor messenger teams provide service on a 24-hour basis for the field army tactical operations center. Three facsimile operators are assigned to operate and perform organizational maintenance on a 24-hour basis on the facsimile equipment installed in the facsimile shelter. Air Force personnel (AR 115-10) will also be provided for processing meteorological data by teletypewriter and facsimile in this shelter. Addi-

tional teletypewriters are included to provide speech-plus-teletypewriter terminals for one army airfield. This equipment will be operated by Air Force personnel.



FM 11-125-20-6

Figure 20-6. Teletypewriter and message center platoon (FATOC).

CHAPTER 21

SIGNAL OPERATIONS COMPANY, MEDIUM HEADQUARTERS

Section I. UNIT CHARACTERISTICS

21-1. Introduction

a. The signal operations company, medium headquarters, when organic to the field army, usually will be assigned to FASCOM headquarters or a headquarters of similar size.

b. If this unit is attached to any unit or headquarters away from its parent organization, the supported unit or headquarters commander will exercise operational control over this signal company. This operational control usually is exercised through a staff signal officer or other appropriate functional staff element.

21-2. Mission

The mission of this unit is to provide signal communication facilities and photographic service for medium-size headquarters in the field army and communications zone.

21-3. Assignment and Allocation

a. The signal operations company, medium headquarters normally is assigned or attached to one of the following headquarters:

- (1) Theater army support command (TASCOM)
- (2) Field army support command (FASCOM)
- (3) Area support command (ASCOM)
- (4) Supply and maintenance command.

b. The unit may also support any other headquarters, including MAAG, missions, or subordinate unified headquarters already deployed, requiring signal communications that are within the capability of the unit.

c. The signal medium headquarters operations company is normally allocated on the basis of one per each of the following: TASCOC, FASCOM, ASCOM, and a supply and maintenance command.

21-4. Capabilities

a. The signal operations company, medium headquarters is capable of:

(1) Providing organic administration, supply and mess facilities, organizational maintenance of organic small arms, vehicles, and power equipment, and direct support level maintenance on organic COMCEL equipment.

(2) Installing, operating, and maintaining a manual telephone central office and the local wire distribution system.

(3) Installing, operating, and maintaining secure tape relay and teletypewriter terminal facilities.

(4) Providing circuit control and information service.

(5) Providing secure radio teletypewriter service.

(6) Establishing and operating a message center, including motor messenger service within the supported headquarters area and to subordinate headquarters.

(7) Providing still and motion picture coverage (except aerial photography).

(8) Establishing and operating a mobile photographic laboratory to develop and process still and motion picture films (except aerial surveillance) as required.

(9) Providing facsimile and transceiver service.

b. When assigned to a headquarters in the communications zone, the company depends on the U.S. Army Strategic Communications Command for trunks connecting the headquarters with the theater army communications system. When attached to FASCOM, the company depends on units of the field army signal brigade for trunks connecting FASCOM headquarters with the army area and command communications systems.

21-5. Limitations

a. This unit depends upon units of the army signal brigade for trunking circuits and carrier termination facilities for integrating this unit

into the area or command communications system.

b. TOE 11-500 teams may be requisitioned in order to increase existing communication capabilities.

c. Appropriate units in the area will provide for medical, financial, religious, and dental services and for supplemental transportation.

d. On the initial move into the field army area, the commander of the signal operations company

will coordinate communications requirements with the army signal officer or with the army signal brigade commander. Subsequent moves will be coordinated with the commanding officer of the area signal center who is responsible for providing communications support.

21-6. Category and Mobility

This unit is designated a category II unit and is 80 percent mobile.

Section II. EMPLOYMENT AND ORGANIZATION

21-7. Employment

a. The signal operations company medium headquarters installs, operates, and maintains the internal communications facilities (telephone, message center, tape relay, teletypewriter terminal, radio facsimile, ADP, and photographic services) for the headquarters or unit to which it is assigned or attached. The company depends on other signal units in the area for the extension facilities required to connect the supported headquarters with the field army communication system.

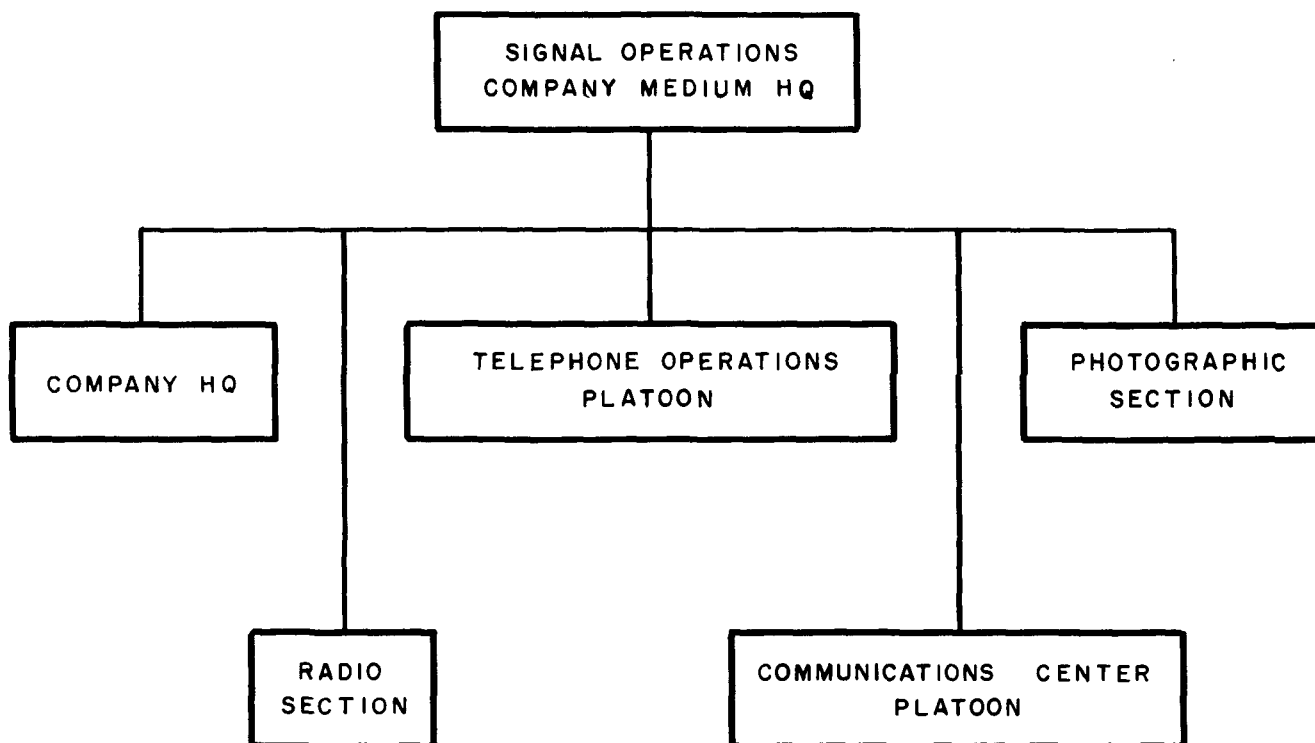
b. Company headquarters and those elements of the company that are not required to operate in the supported headquarters area (motor pool, company mess, unit supply, and photographic

laboratory) normally are located in a bivouac area within a short distance of the supported headquarters. The company usually functions in one echelon.

c. Personnel of the operating elements of the company normally will operate in the headquarters area of the supported headquarters and will be transported to and from the company bivouac area.

21-8. Organization

The signal operations company, medium headquarters (fig. 21-1) is organized with a company headquarters, a telephone operations platoon, a photographic section, a radio section, and a communications center platoon.



FM 11-125-21-1

Figure 21-1. Organization signal operations company, medium headquarters.

Section III. CONCEPT OF OPERATION

21-9. Introduction

The signal operations company, medium headquarters is organized with a company headquarters, a telephone operations platoon, a photographic section, a radio section, and a communications center platoon. A general description of the administrative, supply, and maintenance elements, and a detailed description of the communication operations platoons and sections are contained in paragraphs 21-11 through 21-14.

21-10. Company Headquarters

Company headquarters provides the personnel necessary for the direction and logistical support of the company so it may function as a coordinated organization in the performance of its mission. It provides the means by which the company commander exercises command supervision over the activities of the company and provides personnel necessary to perform organizational maintenance on arms, vehicles, and power equipment.

a. Mess personnel of company headquarters normally will establish and operate mess facilities in the company bivouac area. Through prior arrangements, personnel on duty in the headquarters area of the supported unit may be provided mess support by the major unit to which the company is assigned or attached.

b. Supply personnel maintain company supply records; consolidate requests and requisitions from operating elements; pick up common items of supply, repair parts, and repaired equipment from depots, supply units, or maintenance units, as appropriate; and prepare other reports as required by the parent or supported headquarters. The armorer assigned to company headquarters performs organizational maintenance on unit weapons.

c. Motor maintenance personnel provide organizational maintenance on organic vehicles. These personnel may also supplement the power generator specialist in performing organizational maintenance on the prime mover components of engine generators.

d. Power maintenance personnel are provided to attend diesel power generator sets and to perform organizational maintenance on both gasoline and diesel generator sets.

21-11. Telephone Operations Platoon

The telephone operations platoon (fig. 21-2) installs, operates, and maintains the command headquarters switchboard; installs and operates

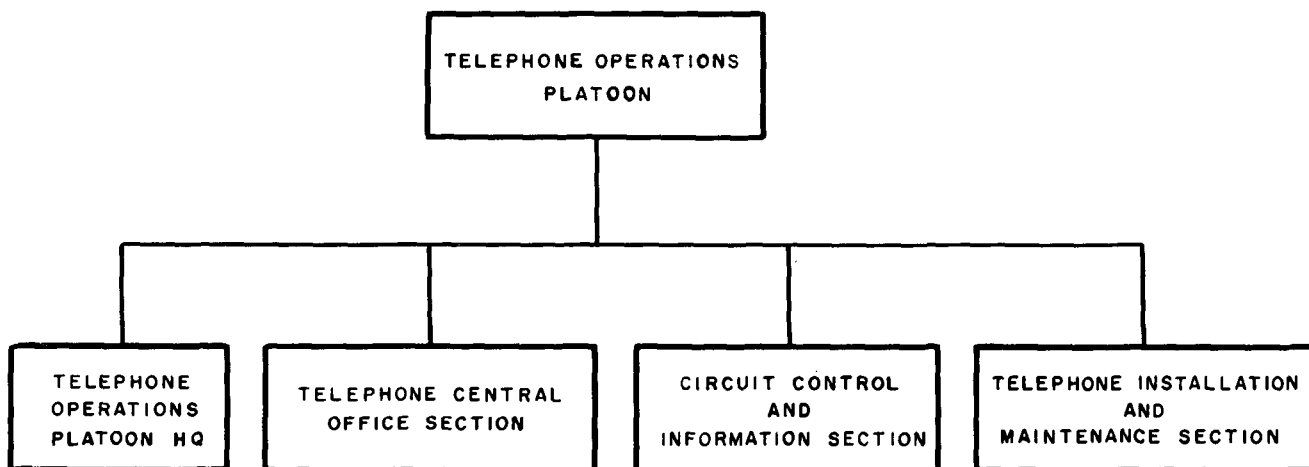
a circuit control facility; installs and maintains the local wire distribution system; and provides an information and directory service.

a. Platoon headquarters provides personnel and facilities to supervise platoon activities in the supported command headquarters. The platoon leader serves as the supported command headquarters wire officer.

b. The telephone central office section operates a nine-position manual telephone central office AN/MTC-9 in the command headquarters signal center. This facility is installed in two semi-trailer vans. These vans are towed by 5-ton truck tractors. The switchboard provides 600 local subscriber lines and 60 manual or dial trunks for the command headquarters and for other units in the vicinity of the headquarters. It may also provide trunk switching service for units in the area that do not have a means of entry into the area communications system. Central office repairmen are provided for maintenance of the telephone exchange and to connect local and trunk circuits brought into the switchboard.

c. The circuit control and information section installs and operates the communications patching panel SB-675/MSC. The section provides facilities control for all means of signal communications installed or operated in the command headquarters signal center. Trunk circuits from trunk terminal facilities are brought into the patching panel for efficient control, continuity of communications service, ease of testing, and to effect necessary routing and rerouting in the event of trunk failure. The patching panel is installed in a shelter which normally is mounted on a 2½-ton truck. Necessary power will be delivered from a central source, or, if no central source is available, from a small trailer-mounted gasoline engine driven generator set which has been provided for the purpose. A small shelter is provided in which personnel of the section prepare, maintain, and distribute a current telephone directory for the headquarters.

d. The telephone installation and maintenance section has sufficient personnel and equipment to provide three five-man wire teams. Each team is equipped with a 2½-ton truck mounting an engine-driven cable reeling machine. The section installs interconnecting cable for components of the signal center and is responsible for the installation, recovery, and maintenance of the local wire distribution system. The tie cables between the company patching panel (SB-675/MSC) and the



FM 11-125-21-2

Figure 21-2. Telephone operations platoon.

trunk terminal facilities will be installed and maintained by the signal unit providing the trunk terminal facilities.

21-12. Photographic Section

Signal photographic services are provided by the photographic section (fig. 21-1) of the company. These services include still and motion picture photographic section (fig. 21-1) of the company, and still photographic laboratory services for the supported headquarters. The section consists of a photographic officer, still and motion picture photographers, and a photographic equipment repairman, and has the equipment necessary to take press (4 × 5 inches), 70mm still and 16-mm and 35-mm motion pictures. The photographic laboratory—the 2½-ton truck-mounted AN/TFQ-7—can process the press and 70-mm still pictures. The motion picture film must be sent to theater army signal photographic units for processing. A photographic equipment repairman is provided to perform direct support level maintenance on organic photographic equipment. The photographic officer also serves as the photographic officer of the supported command headquarters.

21-13. Radio Section

The radio section consists of a section leader (who also serves as the supported command radio officer) and sufficient radio teletypewriter operators to install, operate, and maintain four radio teletypewriter (RATT) sets AN/GRC-26. Each set is mounted on a 2½-ton truck and is equipped with a trailer mounted power generator which is

part of the assemblage. Two teletypewriter security devices are provided each set to furnish secure full-duplex (FDX) operations. The section is also equipped with a radio receiving set AN/GRR-5 which is installed in one of the radio teletypewriter shelters. This receiver is used as a station in the warning net of the next higher headquarters. The type of net in which the RATT sets are used depends on the requirements of the supported headquarters. A radio repairman is provided to perform direct support level maintenance on organizational equipment.

21-14. Communications Center Platoon

The communications center platoon (fig. 21-3) provides the message center, terminal teletypewriter, tape relay, and cryptographic and facsimile facilities for the headquarters. It also operates the supported command signal messenger service. The platoon is organized with a platoon leader, a message center section, teletypewriter terminal section, tape relay section, and a teletypewriter and cryptographic maintenance section. The platoon normally operates in one echelon.

a. Platoon Headquarters. Platoon headquarters provides personnel and facilities to supervise platoon operations. The platoon leader serves as the signal center officer for the supported headquarters.

b. Message Center Section. The message center section processes incoming and outgoing messages in addition to handling message pouches. The section furnishes four messenger teams, with

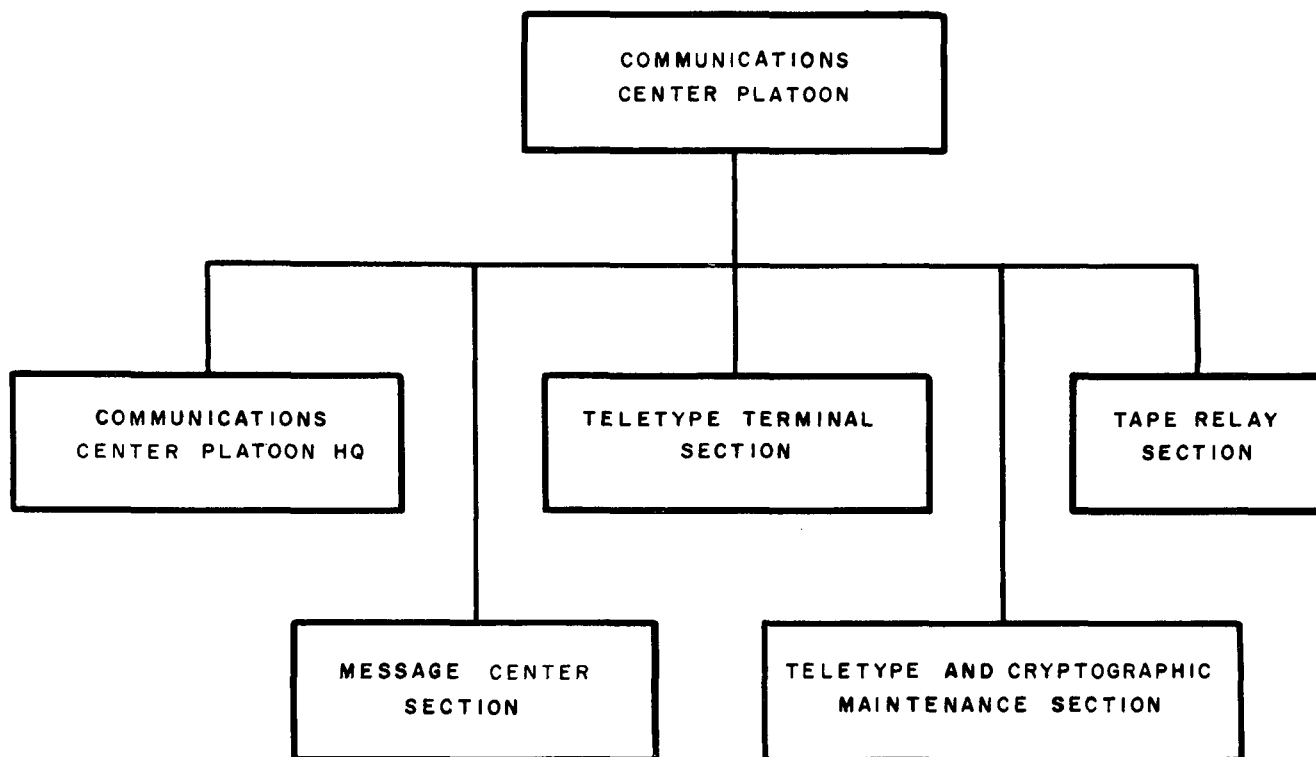
¼-ton trucks, for local message delivery and pickup in the headquarters area, to units located in the vicinity of the headquarters; and to major subordinate units. In addition, when operating in the COMMZ, the messenger teams will deliver pouched messages from the messenger relay points operated by the signal messenger company.

c. Teletypewriter Terminal Section. The teletypewriter terminal section consists of a section chief and the necessary operators and cryptographers to operate the Teletypewriter Terminal AN/MGC-22. The AN/MGC-22 is a van-installed transportable teletypewriter terminal capable of providing four full-duplex (FDX) secure teletypewriter circuits. It normally is used to prepare tapes and receive and transmit messages for the headquarters. Five tape preparation positions, in addition to the four send and receive positions, are provided. Power must be obtained from an external source.

d. Tape Relay Section. The tape relay section consists of a section supervisor and the necessary teletypewriter operators and cryptographers to operate two teletypewriter relay centrals

AN/MGC-23 assigned to the section. The AN/MGC-23 is a transportable teletypewriter relay central capable of providing eight FDX secure teletypewriter trunks. It is used in conjunction with the teletypewriter terminal MGC-22. When the tape relay traffic load exceeds the capacity of one AN/MGC-23, the other may be installed alongside of it with interconnecting passageways for manual exchange of message tapes.

e. Teletypewriter and Cryptographic Maintenance Section. The teletypewriter and cryptographic maintenance section consists of a section chief, teletypewriter and cryptograph equipment repairmen, and two truck-mounted repair shops, each towing a power generator set PU-474/M. The section provides direct support level maintenance on organic teletypewriter and cryptographic equipment. The section may employ two methods of conducting maintenance operations. The first entails bringing the equipment to the repair shop (normally located in the company area) to make necessary repairs; the other, performing the required maintenance or making the necessary repairs on-site. Either method may be used when necessary.



FM 11-125-21-3

Figure 21-3. Communications center platoon.

21-15. Concept of Signal Center Operations (fig. 21-4)

a. The message center section processes incoming and outgoing messages for dispatch over available communications means. One of the two message centers AN/GSQ-80 provides the necessary working space in which to conduct message center operations. It normally is located as close as possible to the teletypewriter terminals so that traffic between them may be quickly and expeditiously handled. The second AN/GSQ-80 houses the facsimile set AN/TXC-1 and the off-line security devices. A five-pair cable should be more than adequate to connect both these assemblages with the patching panel.

b. Patching Panel SB-675/MSC is the hub around which the signal center is constructed. The panel should be located so that cables between it and the trunk terminal facilities can be quickly and easily installed. Consistent with the need for cover, concealment, and dispersion, 26-pair cable lengths should be kept as short as practicable; they should be limited to one section (250 feet) if possible. If longer distances between assemblages are necessary, cables may be added in tandem. While distances of over 1,000 feet are not uncommon, power distribution and transmission losses are introduced which may cause problems that are difficult, if not impossible, to overcome. At best, a degrading may take place in circuit quality.

c. The switchboard AN/MTC-9 should be centrally located in the headquarters area in order to keep field wire lines to local subscribers as short as possible. Because of the large number of field cables (26 pair) required to connect it with the patching panel, it should be located as close as possible to it. Other considerations are noise and physical security.

d. The teletypewriter equipment may be employed in several ways. The method selected is a command decision that is based on existing circumstances.

(1) Normally, the AN/MGC-23 functions as a tape relay central in the theater or field army area communications system. Its purpose is to serve as a major relay station in the communications system, providing additional or alternate routes as and when required. Generally, a relay central receives and transmits but does not terminate teletypewriter traffic.

(2) The AN/MGC-22 serves as a teletypewriter terminal for the supported headquarters. It is connected to the AN/MGC-23 with a 26-pair

cable. Incoming messages destined for the headquarters pass through the tape relay central and terminate in the AN/MGC-22. Here they are converted to page copy and manually forwarded to the teletypewriter terminal, and electrically transmitted to the relay central for entry into the tape relay system. A 26-pair cable also connects the teletypewriter terminal with the patch panel. This arrangement is a practicable way of providing point-to-point teletypewriter service without disrupting or using circuits in the tape relay system.

e. The four radio teletypewriter (RATT) sets AN/GRC-26 should be located to provide reliable communications, while simultaneously keeping the risk of detection and jamming to a minimum. Many situations will permit the grouping of these RATT sets in one area (radio park), preferably in the vicinity of the company bivouac area. If the volume of traffic is low, messages between the radio stations and the message center may be handled by messengers, or teletypewriter tapes may be prepared in the teletypewriter terminal and delivered to the radio stations by messenger. If the traffic volume is high, it may be desirable to use the remote control capabilities of the RATT sets.

(1) Each radio set is connected by field wire lines to a junction box J-1077/U which is located in the radio park. A 26-pair cable is then used to connect the junction box with the patching panel. Patches can be made in the patching panel with the teletypewriter terminal AN/MGC-22.

(2) It may be desirable to bypass the patching panel and to connect the junction box directly with the AN/MGC-22 with a 26-pair cable. Both methods make it possible to control the radio sets from the teletypewriter terminals.

f. The extension facilities necessary to connect the signal center of the supported headquarters with the area communications system are not organic to the signal operations company, medium headquarters, but must be furnished by the signal company that operates the area signal center. For the purpose of illustration, figure 21-4 indicates that radio terminal set AN/MRC-73 and terminal telegraph-telephone AN/MCC-6 are used as trunk terminals; the actual equipment employed, however, will be determined by the number of channels required and the type and availability of equipment. The physical location of these trunk terminals in the supported headquarters area will be decided upon jointly by the terminal chiefs and the signal center officer of the supported headquarters. The cable between

these trunk terminals and the patching panel will be installed by the cable construction personnel of the area signal center.

g. Electrical Power Considerations. While many communications assemblages are provided with trailer-mounted gasoline engine driven generator sets, some are not. Therefore, company headquarters has been provided with two truck-mounted (PU-408/M) and two trailer-mounted (PU-407/M) 45-kw diesel generator sets to provide a central source of power. These diesel units are also satisfactory sources of power for those assemblages which have their own sources of power, but because of noise and other factors it is desirable not to use them. When power is furnished from a central source, the individual gasoline engine-driven units are in a standby status, ready to be used in an emergency, when displacing or when the central source is cut off for main-

tenance. While the use of the large diesel units reduces the amount of maintenance required on the smaller gasoline units, the large units introduce problems that must be considered. First, the large diesel units must be located in the area of the greatest density of equipment so that power may be delivered to as many of them as possible. This tends to bring communications equipments closer together than the tactical situation may permit. Second, the power cables are limited in length to 100-foot sections. Power losses rise rapidly over longer cable lengths. With existing power equipment PU-407/M and PU-408/M, these losses become excessive when a distance of 200 feet is exceeded. Therefore, a compromise must be made between the distance between communications assemblages permitted by the 26-pair cable (250 ft) and the distance between assemblages permitted by the power cable (100 ft).

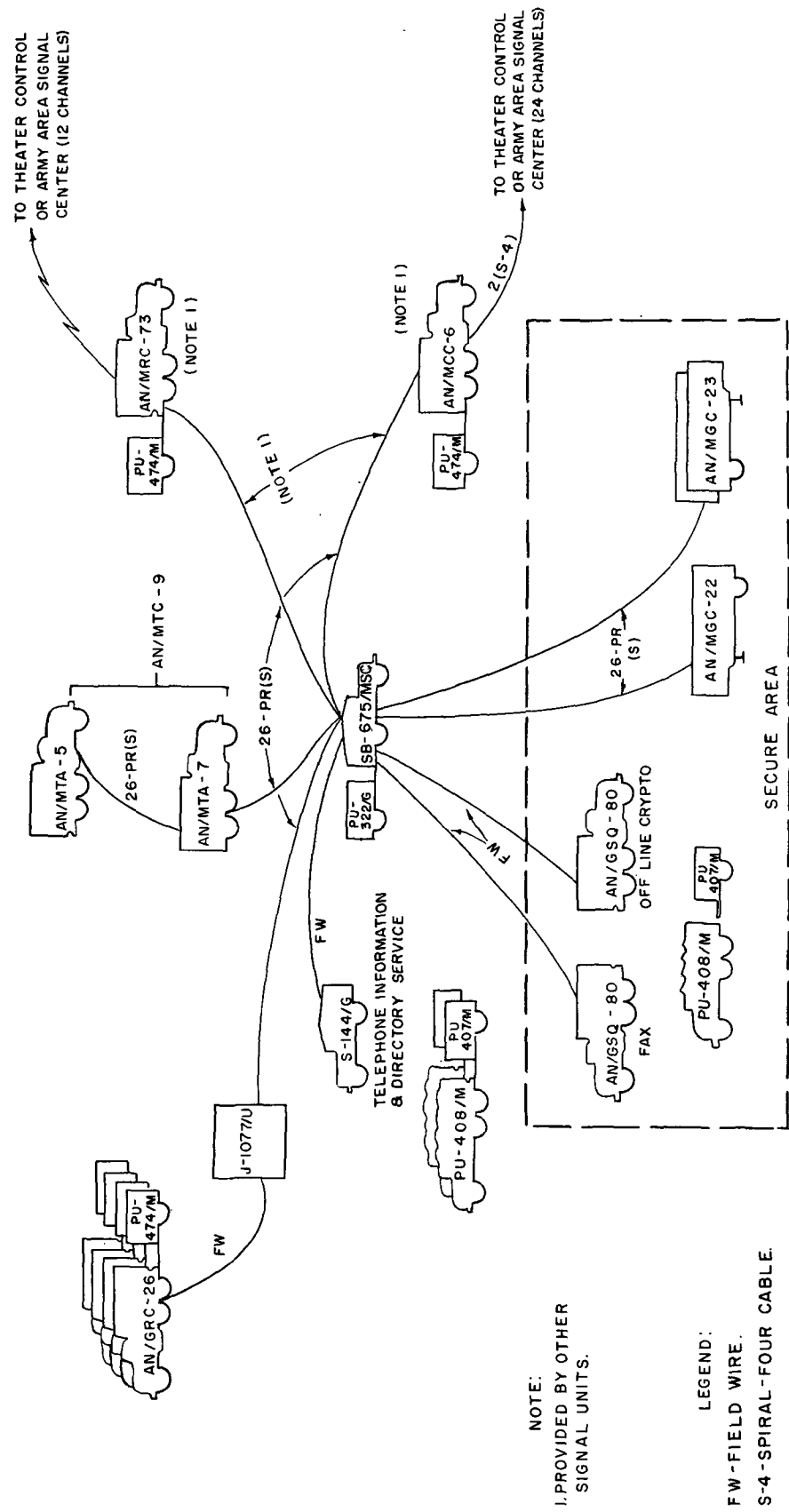


Figure 21-4. Type signal center operated by the signal operations company.

CHAPTER 22

SIGNAL SMALL HEADQUARTERS OPERATIONS COMPANY

Section I. UNIT CHARACTERISTICS

22-1. Introduction

This chapter describes the characteristics, mission operations, and administrative operations of the signal small headquarters operations company.

22-2. Mission

The primary mission of the signal small headquarters operations company is to provide internal communications facilities and photographic service (except aerial combat surveillance) for small-size headquarters in the field army and communications zone.

22-3. Assignment and Allocation

a. This unit normally is assigned to support one of the following:

- (1) Theater army signal group.
- (2) Field army support brigades.

b. The basis of allocation is:

- (1) Six per theater army signal group.
- (2) One per field army support brigade.

22-4. Capabilities

a. At full strength (level 1), this unit:

(1) Installs, operates, and maintains terminal type communication facilities for a supported headquarters to include:

(a) Manual telephone central office and local telephone systems.

(b) Message center, cryptographic, teletypewriter terminal, tape relay, facsimile and data transceiver facilities.

(c) Secure radio teletypewriter facilities.

(2) Establishes and operates a ground messenger service.

(3) Performs photographic service to include:

(a) Still and motion picture coverage (except aerial photography).

(b) Operation of a mobile photographic laboratory for the processing of ground and aerial still photographic coverage (except aerial combat surveillance) as required.

(4) Performs direct support level maintenance on signal communications equipment organic to the company.

(5) Provides unit administration, supply and mess facilities, and organizational maintenance of organic arms, vehicles, and power generators.

b. Levels 2 and 3 (AR 220-1 and AR 135-8) adapt the table for reduced operational capabilities in decrements of 10 percent from approximately 90 percent for level 2 to 80 percent for level 3. Individuals of this organization can engage in effective, coordinated defense of the unit's area or installation.

22-5. Limitations

This unit depends upon:

a. Signal units in the area communications system for trunking circuits and carrier termination facilities for integration into the area communication system.

b. TOE 11-500 teams for additional communication capabilities.

c. Appropriate units in the area for combat service support.

22-6. Category and Mobility

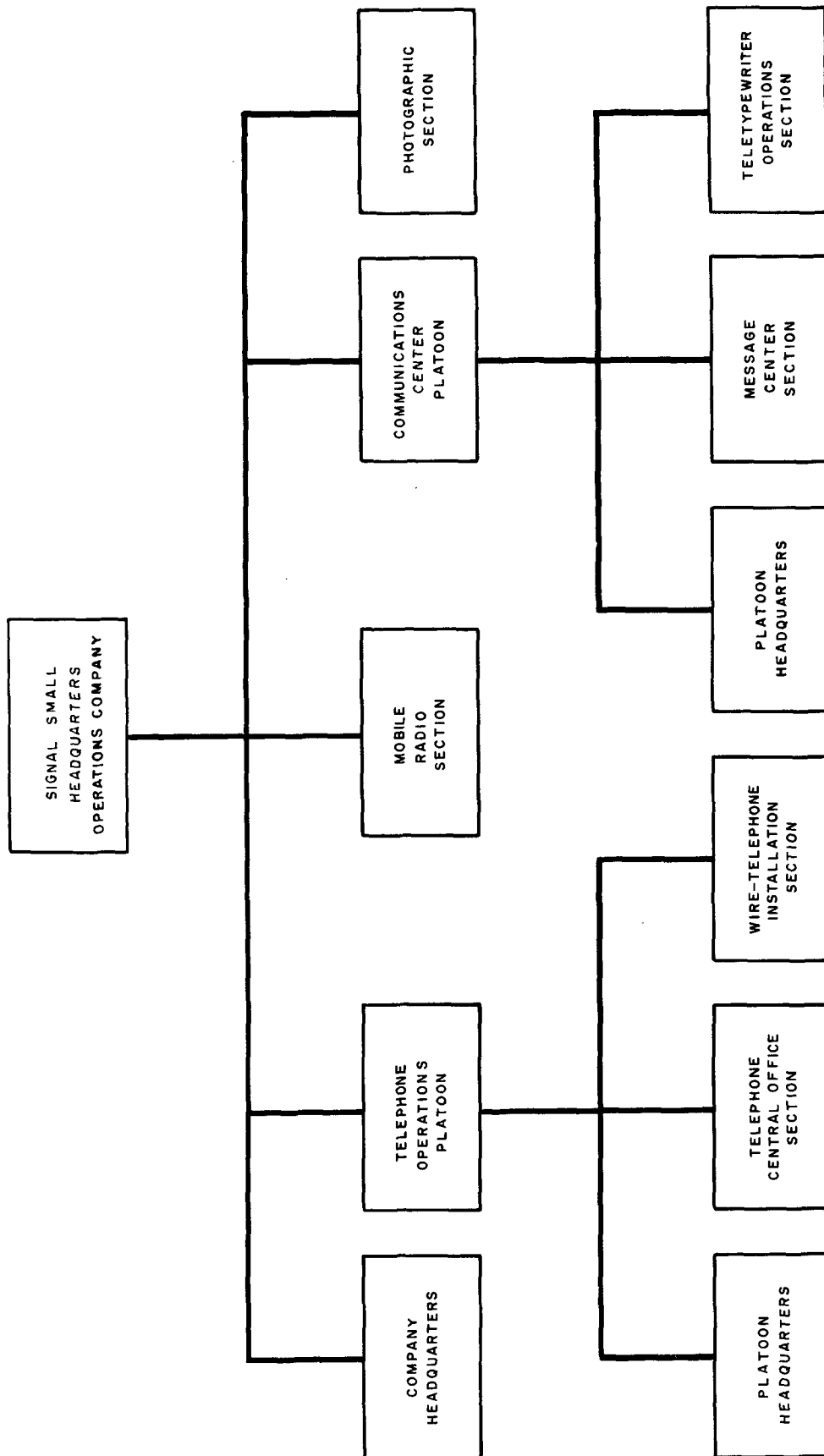
This unit is designated a category II unit (AR 310-25) and is 80 percent mobile.

Section II. ORGANIZATION AND EMPLOYMENT

22-7. Introduction

a. Although the signal small headquarters operations company may be assigned to the theater

army or to a field army, this chapter will deal with the assignment and employment of the company with the field army. Information is con-



FM 11-125-22-1

Figure 22-1. Organization signal small headquarters operations company.

tained in FM 11-23 concerning the assignment and employment of this company with theater army.

b. Figure 22-7 shows a type signal equipment configuration that can be installed, operated, and maintained by the signal small headquarters operations company. The type system can be modified to varying requirements due to the military situation, type of headquarters supported, terrain, or other local conditions. Before the system is installed, a reconnaissance of the area should be made. During the reconnaissance, the following factors should be considered:

(1) Siting the equipment to facilitate internal cabling between equipments.

(2) Siting the communications facilities to best serve the supported headquarters.

(3) Siting the trunk terminals to facilitate cabling to the communications patching panel.

c. The details of planning, installing, operating, and maintaining the communications facilities to include messenger and photographic services are discussed in paragraphs 22-10 through 22-17.

22-8. Organization

The signal small headquarters operations company (fig. 22-1) consists of a company headquarters, a telephone operations platoon, and a photographic section.

a. The telephone operations platoon consists of a platoon headquarters, a central office telephone section, and a wire-telephone installation section.

b. The communications center platoon consists of a platoon headquarters, a message center section, and a teletypewriter operations section.

22-9. Employment

a. The signal small headquarters operations company is employed in the field army to provide internal communications facilities for the headquarters to which it is assigned or attached. These communications facilities and services are discussed in paragraphs 22-10 through 22-17.

b. The signal small headquarters operations company is not equipped with multichannel radio relay or carrier equipment. Therefore, the signal army area company operating the nearest army signal center must furnish the extension facilities required to connect the supported headquarters or unit with the signal center. On the initial move into the field army area, the commander of the signal small headquarters operations company will coordinate communications requirements with the ACSC-E or with the commanding officer of the army signal brigade. Subsequent moves will be coordinated with the commanding officer of the signal center responsible for providing the necessary communications support.

Section III. CONCEPT OF OPERATION

22-10. Introduction

The administrative functions of the signal small headquarters operations company are very similar to most signal operating companies. Company administrative operations will be centered in the company CP. The company commander, however, should never become tied to the company CP at the expense of performing command visits and inspections of company mission operations. In addition to command visits and inspections, the company commander must keep the platoon and section leaders advised of command policies and procedures. The most common methods of informing and coordinating subordinates are through informal discussions, timely orders, and a detailed company SOP. Details of preparation of signal orders and SOP are contained in FM 24-16.

22-11. Company Headquarters

The company headquarters consists of the com-

pany commander, enlisted specialists, and the necessary equipment to establish and operate a company command post. Company headquarters provides services such as company training, mess, supply, and organizational maintenance of organic arms and vehicles. The TOE provides the company headquarters personnel and equipment which may be organized functionally into elements to perform specific services for the company operating platoons and sections. A type organization for company headquarters is shown in figure 22-2.

a. *Command Element.* The command element consists of the company commander who is responsible for establishing the company CP for command and control of the company. He is authorized a 1/4-ton truck with trailer and Radio Set AN/VRC-46 to coordinate communications support for the supported headquarters.

b. *Administration Element.* The administration element consists of the first sergeant, a com-

pany clerk, a personnel specialist, an equipment reports clerk, and an assistant equipment reports clerk. The administration element is closely associated with the company commander in establishing and operating the company CP. This element is equipped with a general purpose tent, safe, typewriters, gasoline engine generator set, and miscellaneous equipment necessary to establish and operate the company CP. Personnel records are located and maintained in the company CP. Because of this, there must be daily coordination between the platoon and section leaders and the administrative personnel of the company CP. This is necessary to coordinate duty rosters, sick call, leaves, pay, mail, promotions, citations, rotation, and many other personnel matters that will require day-to-day attention. Proper personnel management will build morale and add materially to the quality of mission operations. The company CP should be established near the communications installations to facilitate command and control of company operations. The company commander is not provided an officer staff to assist him in establishing and operating the CP. Thus, he must rely on his noncommissioned officers; namely, the first sergeant, supply sergeant, motor sergeant, and mess steward. The company commander normally will form an operational staff consisting of the platoon and section leaders to keep him informed of mission operations. The operational staff may function on an informal basis, or the commander may require briefings on a regular schedule.

c. Mess Element. The mess element consists of a mess steward, three first cooks, two cooks, and a cook's helper. This element is organized and equipped to operate a company mess on a 24-hour basis. The TOE allocates a 2½-ton truck, a water tank trailer, a kitchen tent, ranges cooks' sets, food containers, and tableware necessary to establish and operate the company mess.

(1) The signal small headquarters operations company is equipped to establish and operate a company mess on a 24-hour basis. The company mess is under the direct supervision of the mess steward. He prepares cook duty rosters, ration requests, and supervises food preparation and serving. The mess steward coordinates with company headquarters for the provision of kitchen police (KP).

(2) Since the signal small headquarters, operations company normally is associated with a particular headquarters, it is possible that the headquarters commander may direct a general consolidated mess operation. When so directed,

the mess personnel of the company will be detailed to the consolidated mess facility. This however, does not relieve the company commander of the details of messing his troops. He must coordinate with the consolidated mess facility functions of the mess such as company mess personnel for duty, KP, number of signal troops to be fed, and the hour of messing.

d. Supply Element. The company supply element consists of a supply sergeant (also designed as the company armorer), a unit supply specialist, and a signal supply-parts specialist. This element is equipped with a 2½-ton truck with trailer, a general purpose tent, armorer's toolkit, carpenters' toolkit, and a tentage repair kit. The 2½-ton truck and trailer are used to haul supplies for the company. Supply operations are also discussed in Part One.

(1) Company supply records are maintained for TOE and TA property and individual clothing and equipments.

(a) Normally, the company property book is established and maintained by the supply sergeant at the company CP. The platoons and sections are issued TOE property on hand receipt. If the equipment becomes inoperative because of negligence on fair wear and tear, it is disposed of and replacements are requisitioned according to the provisions of AR 735-35.

(b) The records for individual clothing and equipment are also maintained by the supply sergeant at the company CP. Each individual soldier is issued clothing and equipment according to the appropriate table of allowance, and each soldier is responsible for the proper care and use of his individual clothing and equipment. Replacements for individual clothing and equipment are requisitioned through regular supply channels supporting the company.

(2) Company records are not required for expendable supplies; however, the company commander should insure that each platoon and section exercises supply economy. Expendable supplies are requested by the operating platoons and sections from the company supply sergeant on an informal basis. The company supply sergeant consolidates three requests and forwards the formal consolidated requisition to the supply activity supporting the company. When the requested supplies are received at company CP, the supplies are segregated according to each platoon and section request and delivered to the platoons and sections.

(3) Supply procedures and techniques for stability operations will require special planning

because of the hazards encountered along roads and the great dependence on aerial supply. Supply planning must consider the stockage of larger quantities of essential items and planning the resupply well in advance of the normal requisitioning cycle.

e. Motor Element. The motor element consists of a motor sergeant, three wheeled vehicle mechanics, two wheel vehicle apprentices, and a light-truck driver. This element is equipped with two 2½-ton trucks with trailers (one truck is equipped with a winch), a 5-ton wrecker, a maintenance tent, toolkits, and a gasoline tank and pump unit. The motor element provides organizational motor maintenance and operates a gasoline distribution point for the company. Details of maintenance management are contained in chapter 7. The maintenance personnel of the signal small headquarters operations company are employed as follows:

(1) At company headquarters, organizational motor maintenance is performed under the supervision of the motor sergeant. The motor sergeant establishes a consolidated motor maintenance shop in the company CP area for those company vehicles that can be moved to the shop for maintenance. Those vehicles mounting shelter equipments which cannot be moved to the motor maintenance shop must be maintained onsite with the aid of the 5-ton wrecker.

(2) Organizational small arms maintenance is performed in a consolidated maintenance shop in the supply tent at the company CP. The supply sergeant is responsible for organizational small arms maintenance.

(3) Each operating platoon and section is provided electronics maintenance personnel for direct support level of maintenance on operating equipment. The mobile radio sections are provided crypto maintenance by the crypto repairmen of the communications center platoon. These maintenance personnel provide onsite maintenance of equipments on a scheduled or emergency basis.

(4) The telephone platoon, the mobile radio section, and the communications center platoon

are provided powermen for onsite organizational maintenance of gasoline engine power generators. The powermen normally are employed under the direct supervision of the platoon and section leaders.

(5) Maintenance in stability operations requires continuous emphasis on preventive maintenance to insure equipment operation under adverse conditions. Mobile maintenance teams should be available to make periodic on-call visits to service the equipment of the operating sections or teams that are widely dispersed.

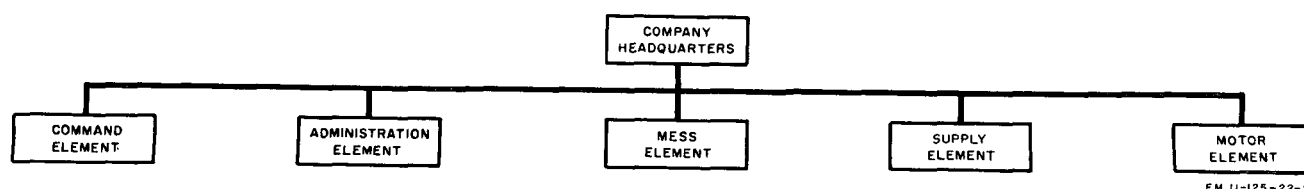
22-12. Telephone Operation Platoon Headquarters

(fig. 22-3)

This platoon headquarters plans the layout and supervises the installation, operation, and maintenance of the communications equipment for patching, telephone switching, and local telephone and teletypewriter circuits as shown in figure 22-7. Platoon headquarters must also coordinate with the signal operating units responsible for trunking facilities for the provision and installation of these facilities.

a. The layout of the equipments should be arranged to provide ease of cabling between each piece of equipment. The siting of the communications patching panel (SB-611/MRC) is of utmost importance, since most of the communications equipments are cabled to this facility. The communications patching panel should be centrally located within the communications area of the supported headquarters to facilitate internal cabling.

b. Prior to a move, all personnel not required for normal duties should be used to disassemble and load equipment and, after the move, for the initial installation at the new location. Cross-training of switchboard operators and central office repairmen in wire-cable installation will make these personnel proficient in installation duties. By using all available personnel, a reduction in the disassembly and installation time and provision of better service to the supported headquarters will result.



FM 11-125-22-2

Figure 22-2. Type organization for company headquarters.

22-13. Central Office Telephone Section

The central office telephone section installs, operates, and maintains the manual Telephone Central Office AN/MTC-1, and provides information and directory service for the supported headquarters. The AN/MTC-1 consists of a shelter-mounted Switchboard Group AN/MTA-3 and a shelter-mounted Connecting and Switching Group AN/MTA-4. The AN/MTA-3 and AN/MTA-4 must be sited close together since the interconnecting cables are in 25-foot lengths.

a. Normal operations and maintenance of equipments are discussed in the technical manuals of the equipment and maintenance records in TM 38-750. Maintenance of equipments is a continuous process; however, routine maintenance should be performed when it will least interfere with operations. Emergency maintenance is provided as required.

b. The TOE provides a telephone switchboard operator supervisor for overall supervision of the operations of the AN/MTA-3. Three senior telephone switchboard operators and nine telephone switchboard operators are assigned, which provides for four switchboard operators for each of the three 8-hour shifts. This authorizes an operator for each of the three switchboard positions and one operator for the information position. The switchboard should be fully manned at all times; however, during the low traffic periods one or more of the operators on duty, depending on the volume of traffic, can perform operator maintenance on the vehicle (2½-ton truck), shelter and switchboard group AN/MTA-3.

22-14. Wire-Telephone Installation Section (fig. 22-3)

The wire-telephone installation section is responsible for the installation, operation, and maintenance of the Communications Patching Panel SB-611/MRC, and for the installation and maintenance of local telephone and teletypewriter cable and wire circuits. The communications patching panel forms the heart of the communications system for the supported headquarters; thus, it is extremely important that this facility be given a high priority of installation. The communications patching panel should be centrally located to provide access for 26-pair cables providing local and trunk circuits. Circuits are connected to the patching panel to provide a means for arranging, rearranging, controlling, and troubleshooting the circuits.

a. During the initial installation, all available

personnel of the section should be used. Switchboard operators, central office repairmen, and technical control specialists, not required for their normal duties, can form wire-cable installation teams to assist in the installation. The organization of teams will depend on the local situation.

b. Field wire and/or 26-pair cable may be used to provide local telephone and teletypewriter circuits. When 26-pair cables are used, Junction Box J-1077 will provide entry points for local circuits (fig. 22-7).

c. For normal operations, three wire-cable installation teams may be organized with a team chief, a senior wireman, two telephone installer-repairmen, and two wiremen.

d. Trunk circuits are provided by other signal operating units in the area. The trunk circuits are connected from the trunk terminals to the communications patching panel by 26-pair cables. The technical control specialists, in the communications patching panel, patch telephone trunk circuits through the patching panel to the AN/MTC-1, and teletypewriter trunk circuits to the AN/MS-29. Trunk circuits that are sole-user circuits are patched through the patching panel to the terminal equipment terminating those circuits.

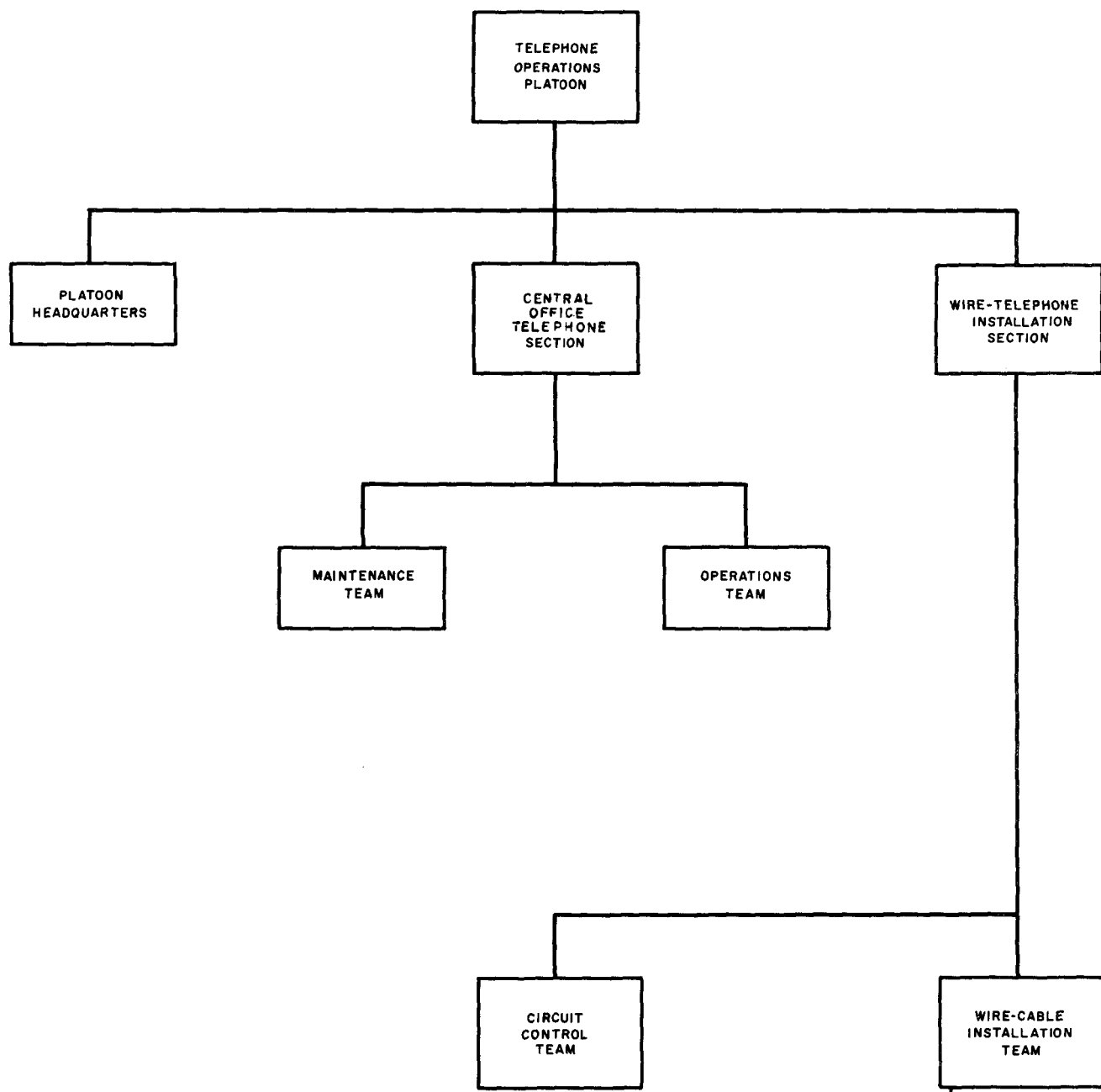
e. The trunk terminal facilities, to include the 26-pair cables connecting to the patching panel, are the responsibility of the signal unit providing the trunk circuits. However, the wire-cable installation section may be required to assist in the installation of trunk facilities.

f. All wire and cable installed within a command post area should be installed underground or overhead. This protects the wire and cable from danger by vehicular traffic within the command post. Consult FM 24-20 for proper underground and overhead installation.

g. Local conditions will dictate the organization of duty shifts to install new circuits, rearrange existing circuits, and operate and maintain the equipment of this section. Duty shifts must be arranged to provide service on a 24-hour basis.

22-15. Mobile Radio Section (fig. 22-4)

This section is equipped with three Radio Sets AN/GRC-26 to provide HF/AM radio communication for the supported headquarters. The sets can provide communications by radio teletypewriter (RATT), amplitude-modulated (AM) voice, continuous-wave (CW), or a combination of



FM 11-125-22-3

Figure 22-3. Type organization of the telephone operations platoon.

RATT and AM voice. Normal range for these sets are 400 kilometers on voice. The sets normally are operated as a RATT station, but may be operated on voice or CW when required. When the sets are used in combination RATT and voice, the voice signal is superimposed on the RATT signal without equipment modification. These sets may be operated full-duplex or one-way reversible in net operation or to provide a point-to-point radio circuit.

a. Radio Sets AN/GRC-26 may be employed to provide—

(1) Communications during the initial installation of the communications system for the supported headquarters.

(2) A voice or CW station on the move, and a RATT station during halts, during the displacement of the supported headquarters.

(3) RATT, voice, or CW station in a higher headquarters net during normal operations.

within the headquarters area will depend on the type of supported headquarters and the location of other communications equipment of the company.

(4) Factors to consider in the layout of the communications center are—

(a) The location of facilities should facilitate message handling.

(b) The message center should be located near the AG distribution center.

(c) Facilities should be located as near the patching panel as possible to facilitate the termination of the multipair cables.

(d) Coordination with the section leader of the mobile radio section on the location and use of those facilities.

(e) Positioning the truck-mounted message center and telegraph terminal vehicles tailgate to tailgate to facilitate message handling between these facilities.

(5) Prior to a move, all available personnel of the platoon should be employed to disassemble and prepare the equipment for movement at the old location and, after the move, install the equipment at the new location. This will require teamwork and the establishment of detailed procedures if the platoon is to move efficiently.

b. Message Center Section. The message center section receives, logs, processes, and dispatches outgoing messages for transmission and incoming messages for delivery to the AG distribution center of the supported headquarters. Message handling procedures within the communications center are established and are published in the platoon SOP. Message handling procedures are discussed in FM 24-17. The section consists of a section leader, a crypto technician, a signal message center supervisor, and additional personnel necessary to operate the message center facilities of the platoon. Figure 22-5 shows a type organization with various operating teams. The exact composition of these teams will depend upon the mission to be accomplished. The message center section is equipped with a message center shelter mounted on a 2½-ton truck, offline crypto equipment, facsimile set AN/TXC-1, and miscellaneous items required to install and operate a message center.

(1) Generally, messages are handled by the message center as follows:

(a) An outgoing message is received from the AG distribution center, logged in, processed, encrypted if required, means of transmission selected, and passed to the means operator for

transmission. After the message is transmitted, the time of transmission is entered on the message and on the operator's log, and the message is returned to the message center. In the message center, the time of transmission is entered on the message center log and the message returned to the AG distribution center.

(b) An incoming message is received from the means operator, logged in, decrypted if required, and given to a messenger for delivery to the AG distribution center.

(c) Close coordination should be established between the message center and the AG distribution center for the control of message traffic. This will reduce to a minimum the inquiry about messages handled between the two agencies.

(2) The message center section encrypts a classified message prior to transmission when the message is to be delivered by messenger or when on-line crypto equipment is not used, and decrypts an incoming encrypted message before delivery to the AG distribution center.

(3) The message center section installs, operates, and maintains the Facsimile Set AN/TXC-1. The facsimile set is used to transmit and receive maps, map overlays, photographs, and similar pictorial subjects. A good voice circuit is required for operation of this facility.

(4) The message center team organization is shown in figure 22-4; however, the teams must be broken down into duty shifts for the operation of the message center on a 24-hour basis. The organization of duty shifts will depend on traffic conditions of the supported headquarters. A large number of personnel are required to process and handle messages during peak traffic periods and less personnel on duty when message traffic is relatively low.

(5) The motor messenger teams of the message center play a vital part in the transmission of message traffic in and out of the communications center. Motor messengers are used for delivery of—

(a) Urgent messages when electrical means are not available or when messenger is the fastest means of delivery.

(b) Bulky items.

(c) Bulky, low-priority messages to relieve the electrical means.

(d) Clear text classified messages to a headquarters not equipped with cryptographic equipment.

(e) Registered documents.

(4) A point-to-point radio channel to a subordinate unit, or to terminate a point-to-point radio channel from higher headquarters.

(5) Emergency CW communications when other methods of emission are less reliable because of poor atmospheric conditions.

b. Radio Sets AN/GRC-26 can be netted with other radio sets with similar characteristics such as the AN/GRC-106, -108, -122, and -142.

c. The radio stations may be sited near the communications center within the command post and operated from the location. However, if siting within the headquarters is not suitable, the sets may be located up to 10 miles from the headquarters area and operated by remote control (TM 11-5820-256). When the radio stations are located outside the headquarters area, provisions must be made for physical security of the radio stations.

d. Siting is the most important factor for proper operation of Radio Set AN/GRC-26. For additional information on siting Radio Set AN/GRC-26, refer to TM 11-5820-256-10. For details of radio operations, refer to FM 24-18, which also includes siting procedures peculiar to an EW environment.

★22-16. Communications Center Platoon

(fig. 22-5)

The communications center platoon (fig. 22-5) consists of a platoon headquarters, a message center section, and a teletypewriter operations section. The platoon installs, operates, and maintains facilities for processing and transmitting message traffic for the supported headquarters.

a. *Communications Center Platoon Headquarters.* The platoon headquarters plans and supervises the layout, installation, operation, and maintenance of the communications center facilities for the supported headquarters. The platoon headquarters consists of a platoon leader, a platoon sergeant, and a powerman.

(1) The platoon leader, assisted by the platoon sergeant (NCO), provides command, direction, and supervision of platoon operations.

(2) The powerman provides organizational maintenance for the gasoline engine generating equipment of the platoon.

(3) The platoon is equipped with a message center shelter and two telegraph terminals. The layout of the communications center facilities

within the headquarters area will depend on the type of supported headquarters and the location of other communications equipment of the company.

(4) Factors to consider in the layout of the communications center are—

(a) The location of facilities should facilitate message handling.

(b) The message center should be located near the AG distribution center.

(c) Facilities should be located as near the patching panel as possible to facilitate the termination of the multipair cables.

(d) Coordination with the section leader of the mobile radio section on the location and use of those facilities.

(e) Positioning the truck-mounted message center and telegraph terminal vehicles tailgate to tailgate facilitate message handling between these facilities.

(5) Prior to a move, all available personnel of the platoon should be employed to disassemble and prepare the equipment for movement at the old location and, after the move, install the equipment at the new location. This will require teamwork and the establishment of detailed procedures if the platoon is to move efficiently.

b. *Message Center Section.* The message center section receives, logs, processes, and dispatches outgoing messages for transmission and incoming messages for delivery to the AG distribution center of the supported headquarters. Message handling procedures within the communications center are established and are published in the platoon SOP. Message handling procedures are discussed in FM 24-17. The section consists of a section leader, a crypto technician, a signal message center supervisor, and additional personnel necessary to operate the message center facilities of the platoon. Figure 22-5 shows a type of organization with various operating teams. The exact composition of these teams will depend upon the mission to be accomplished. The message center section is equipped with a message center shelter mounted on a 2 1/2-ton truck, offline, crypto equipment, facsimile set AN/TXC-1, and miscellaneous items required to install and operate a message center.

(1) Generally, messages are handled by the message center as follows:

(a) An outgoing message is received from the AG distribution center, logged in, processed, encrypted if required, means of trans-

mission selected, and passed to the means operator for transmission. After the message is transmitted, the time of transmission is entered on the message and on the operator's log, and the message is returned to the message center. In the message center, the time of transmission is entered on the message center log and the message returned to the AG distribution center.

(b) An incoming message is received from the means operator, logged in, decrypted if required, and given to a messenger for delivery to the AG distribution center.

(c) Close coordination should be established between the message center and the AG distribution center for the control of message traffic. This will reduce to a minimum the inquiry about messages handled between the two agencies.

(2) The message center section encrypts a classified message prior to transmission when the message is to be delivered by messenger or when on-line crypto equipment is not used, and decrypts an incoming encrypted message before delivery to the AG distribution center.

(3) The message center section installs, operates, and maintains the Facsimile Set AN/TXC-1. The facsimile set is used to transmit and receive maps, map overlays, photographs, and similar pictorial subjects. A good voice circuit is required for operation of this facility.

(4) The message center team organization is shown in figure 22-4; however, the teams must be broken down into duty shifts for the operation of the message center on a 24-hour basis. The organization of duty shifts will depend on traffic conditions of the supported headquarters. A large number of personnel are required to process and handle messages during peak traffic periods and less personnel on duty when message traffic is relatively low.

(5) The motor messenger teams of the message center play a vital part in the transmission of message traffic in and out of the communications center. Motor messengers are used for delivery of—

(a) Urgent messages when electrical means are not available or when messenger is the fastest means of delivery.

(b) Bulky items.

(c) Bulky, low-priority messages to relieve the electrical means.

(d) Clear text classified messages to a

headquarters not equipped with cryptographic equipment.

(e) Registered documents.

(6) The three motor messenger teams of the message center section are used to provide scheduled and special messenger service. Scheduled messengers follow a predetermined route on a prearranged time schedule for delivery and pickup of messages. Special messengers are dispatched when the urgency of the message requires their use.

(7) Motor messenger teams are normally used between the echelons of a supported headquarters; however, they may be used for delivery of messages to subordinate or adjacent units.

(8) The motor messenger teams are under the control of the message center supervisor who prepares messenger duty shifts and motor messenger schedules.

c. Teletypewriter Operations Section. The teletypewriter operations section transmits and receives teletypewriter message traffic for the communications center. The section is equipped with two telegraph terminals AN/MSQ-29 and a repair shop mounted on 2 1/2-ton trucks. The telegraph terminals provide teletypewriter terminal sets, on-line cryptographic devices, and a voice frequency switchboard to switch teletypewriter circuits.

(1) During the initial installation of the communications center, the teletypewriter operations section functions as follows:

(a) Sites the AN/MSQ-29 tailgate to tailgate with the AN/GSQ-80 and as near as possible to the patching panel.

(b) Moves the power generators away from the AN/MSQ-29 to reduce noise, and installs the power cables from the generator equipment to the *in* terminal in the power and signal entrance box on the AN/MSQ-29.

(c) Installs the 26-pair cables from the AN/MSQ-20 to the patching panel.

(d) Connects local and trunk teletypewriter circuits to the teletypewriter switchboard and tests and checks circuits. When all circuits are operational, the section can revert to normal operations.

(2) Normally, this section functions as follows:

(a) Receives an outgoing message from the message center section, enters the message number on the operator's log, transmits the message, enters the time and date of transmission

on message form and operator's log, and returns the message to the message center section.

(b) An incoming message is received from the distant station. Time and date of receipt and message number are entered on the operator's log and on the message form, and the message is passed to the message center section.

(c) To conserve circuit time, tapes should be prepared of outgoing messages and then the tapes transmitted by automatic transmission.

(3) This section is responsible for teletypewriter and cryptographic maintenance of section equipment. The crypto and teletypewriter equipment repairmen are provided a shop truck in which to work. Routine maintenance is scheduled when traffic is low, and the emergency maintenance is performed as required. The crypto equipment repairman is responsible for maintenance of the cryptographic equipment used in the communications center platoon and the mobile radio section.

22-17. Photographic Section (fig. 22-6)

The photographic section provides the supported headquarters with intelligence, operational record, information, and miscellaneous photography. Miscellaneous photography includes accident, medical, training and identification photography. The section is capable of still and motion picture coverage, and processing of still film. Ex-

posed motion picture film is forwarded to a theater army photographic laboratory for processing.

a. The photographic section may be organized as shown in figure 22-6 or this organization may be adapted to local conditions.

b. The photographic section headquarters performs the following functions:

(1) Plans and controls the operations of the photographic section.

(2) Receives photographic requests from staff sections of the supported headquarters.

(3) Analyzes the requests to determine the best method of coverage.

(4) Assigns photographic missions to the photographic teams and briefs the photographers.

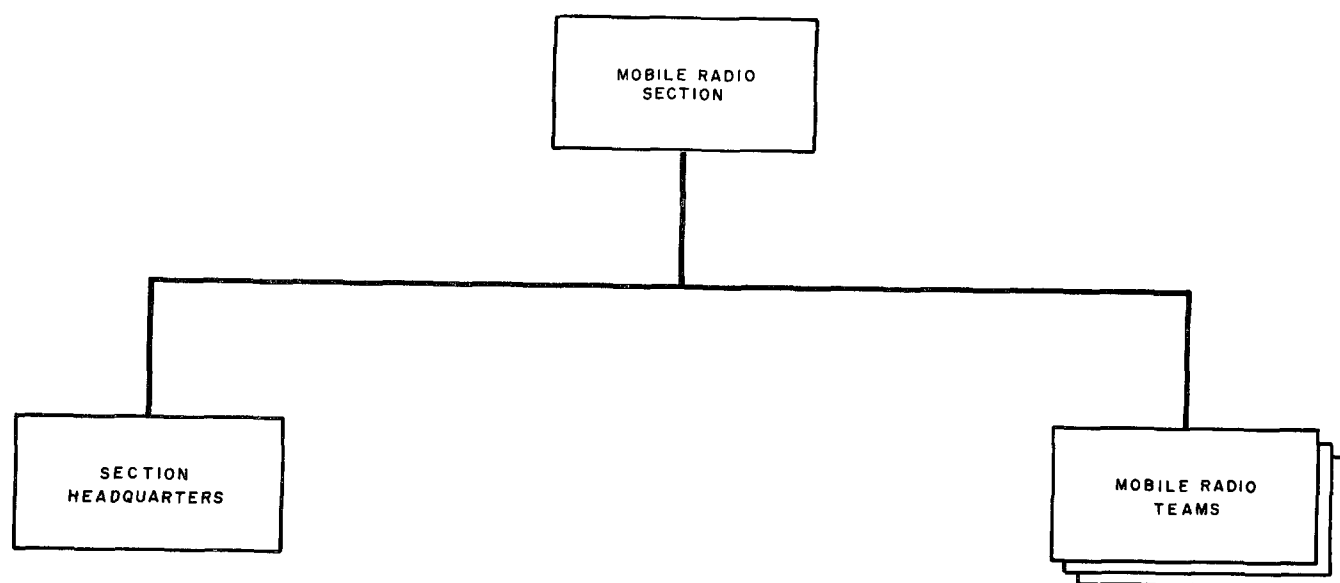
(5) Supervises the photographic mission and laboratory processing.

(6) Prepares job orders and forwards motion picture film to a designated theater army pictorial laboratory for processing.

(7) Receives the finished product and forwards the required number of prints to the staff section making the request.

(8) Coordinates the provision of photographic supplies with company headquarters.

(9) Plans and provides photographic equipment repair for the section.



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Figure 22-4. Type organization of the mobile radio section.

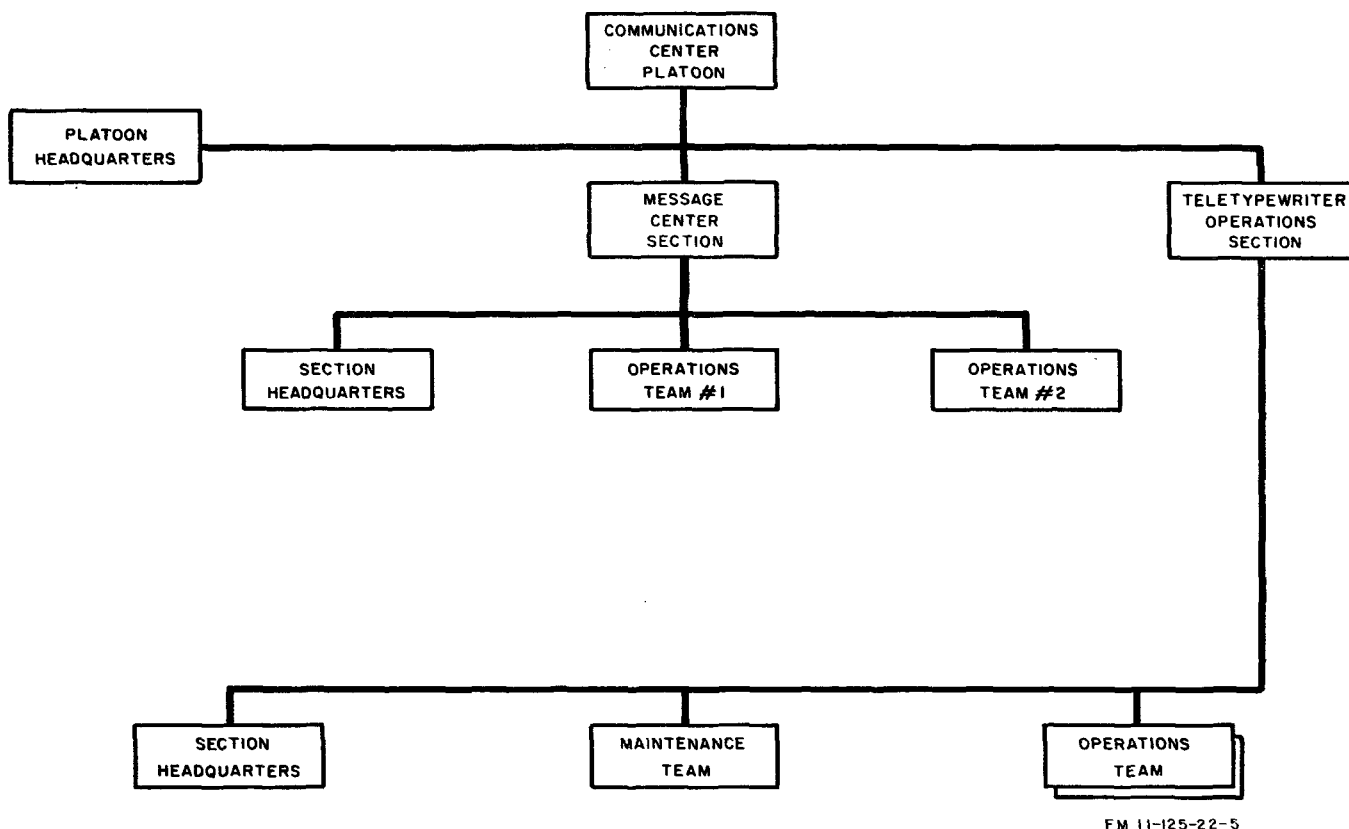


Figure 22-5. Type organization of communications center platoon.

(10) Controls the use of the still and motion picture projectors and screens.

c. The photographic team is equipped with the necessary still and motion picture cameras that provide the team with the capability of all types of ground photographic coverage. In addition, the team is provided two 1/2-ton trucks with trailers which provide team mobility. The team is capable of providing coverage within the headquarters or they can move to subordinate headquarters and installations to perform photographic missions. The team performs the following functions:

- (1) Receives photographic missions and briefings from section headquarters.
- (2) Moves to the subject area and makes the necessary photographic coverage.
- (3) Still photographers forward the photographic request and exposed still film to the photographic laboratory for processing.
- (4) Motion picture photographers forward

the photographic request and exposed motion picture film to section headquarters.

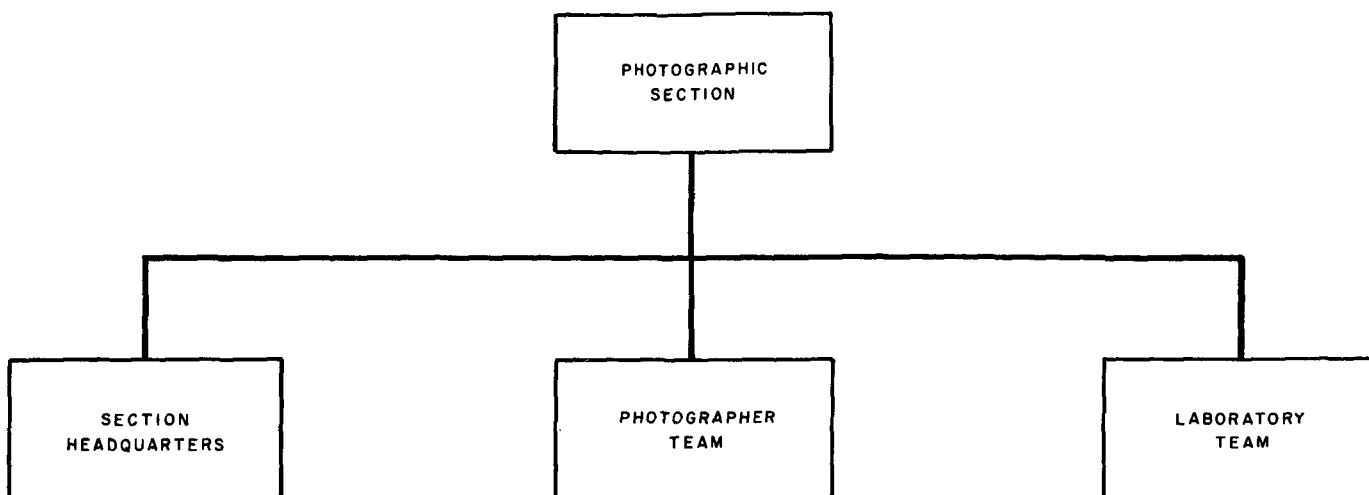
(5) Coordinates photographic equipment repair with the photographic equipment repairman.

(6) Coordinates photographic supplies with section headquarters.

d. The photographic laboratory team develops still film and processes photographic prints as directed by the photographic request. This team performs the following functions:

- (1) Receives photographic requests and exposed still film from the still photographers.
- (2) Develops the exposed film and processes the required number of prints.
- (3) Forwards the photographic request, negative, and prints to the section headquarters.
- (4) Coordinates photographic equipment maintenance with the photographic equipment repairman.
- (5) Coordinates photographic supplies with section headquarters.

Figure 22-6. Type organization of photographic section.



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APPENDIX A

REFERENCES

A-1. Allied Communication Publication (ACP)

(CMHA) ACP 121	Communications Instructions—General (U).
(C) ACP 122C	Communications Instructions—Security (U).
(C) ACP 124	Communications Instructions—Radio-Telegraph Procedure (U).
ACP 127	Communications Instructions—Tape Relay Procedure.
ACP 129	Communications Instructions—Visual Signaling Procedure.

A-2. Army Regulations (AR)

105-10	Communications Economy.
220-1	Unit Readiness.
310-25	Dictionary of United States Army Terms.
310-50	Authorized Abbreviations and Brevity Codes.
380-5	Safeguarding Defense Information.
(C) 380-40	Department of the Army Policy for Safeguarding COMSEC Information.
380-41	Control of COMSEC Materiel.
(C) 380-51	Transmission of Classified Information (U).
(C) 380-52	Codes, Nonmachine Ciphers and Authentication Systems (U).
711-16	DSU/Installation Stock Control and Supply Procedures (Army Field Stock Control System).
755-26	Captured Enemy Equipment and Other Foreign Materiel.

A-3. Field Manuals (FM)

1-100	Army Aviation Utilization.
11-23	U.S. Army Strategic Communications Command (thtr).
11-40	Signal Corps, Pictorial Operations.
11-50	Signal Battalion, Armored Infantry, and Infantry (Mechanized) Divisions.
11-57	Signal Battalion, Airborne Division.
11-92	Corps Signal Battalion and Airborne Corps Signal Battalion.
21-30	Military Symbols.
21-60	Visual Signals.
24-1	Tactical Communications Doctrine.
24-16	Signal Orders, Records and Reports.
24-17	Tactical Communications Center Operations.

24-19	Communications-Electronics Reference Data.
24-20	Field Wire and Field Cable Techniques.
29-22	Maintenance Battalion and Company Operations (Nondivisional).
30-5	Combat Intelligence.
31-23	Stability Operations, U.S. Army Doctrine.
54-3	The Field Army Support Command.
54-4	The Support Brigade.
100-5	Operations of Army Forces in the Field.
100-10	Combat Service Support.
100-15	Larger Units Theatre Army—Corps.
100-27	U.S. Army/U.S. Air Force Doctrine for Tactical Airlift Operations.
101-5	Staff Officers' Field Manual: Staff Organization and Procedure.

A-4. Supply Bulletins (SB)

11-244	Stockage of Signal Items for Use as Maintenance Float (Exchange).
11-478	Cannibalization as a Source of Supply for Signal Parts.

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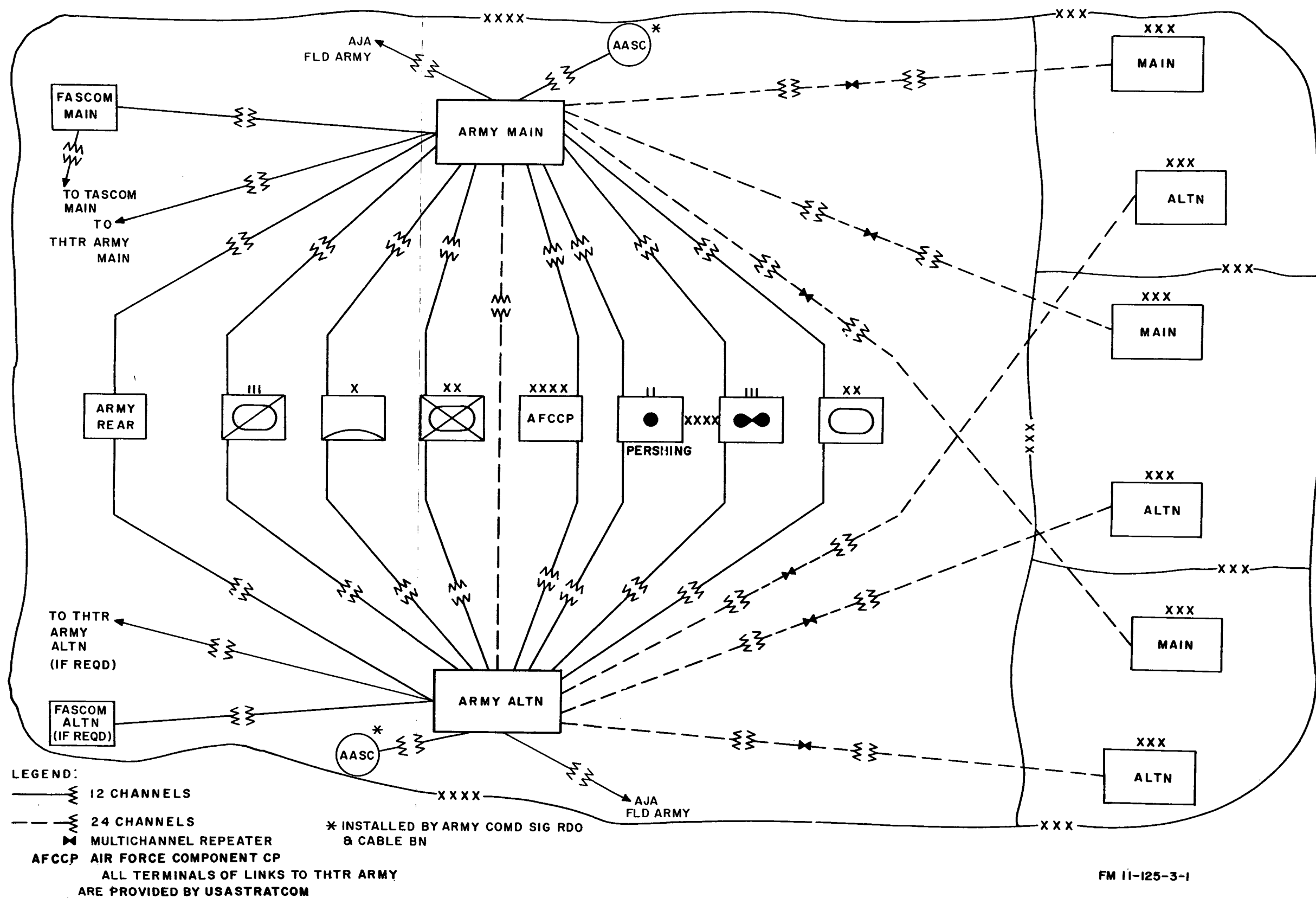
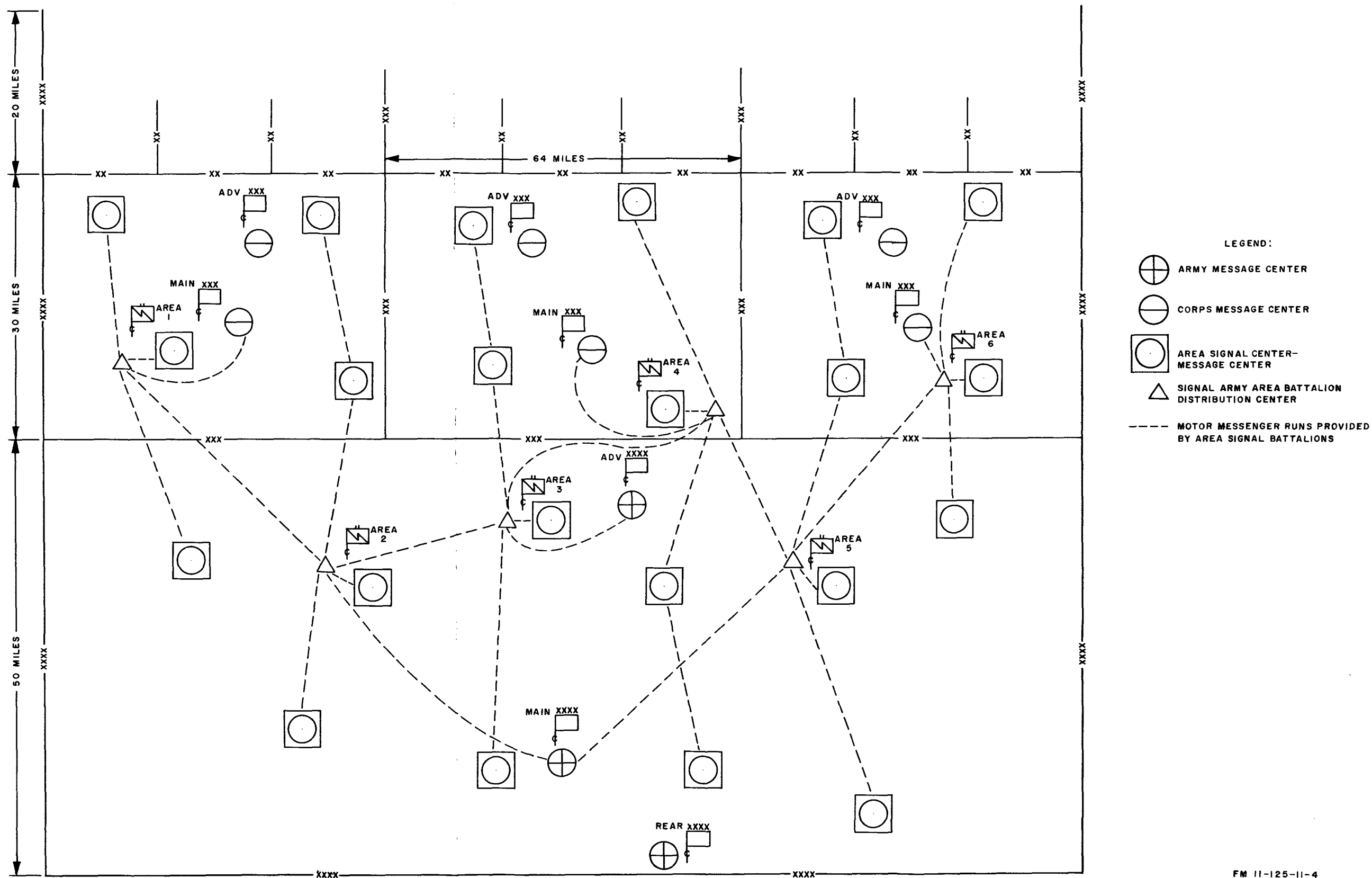


Figure 3-1. Type field army command communications system.



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Figure 11-4. Type army area signal messenger service.

